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Supporting Table S1. Kinetic data for the concentration and temperature dependence of the reaction of [Ru(η^5-C_5H_5)(η^4-C_5H_4O)(CH_3CN)]CF_3SO_3 (**2**) with P(2,4,6-trimethoxyphenyl)$_3$ in acetone. The λ values represent the observed pseudo-first order rate constants. The calculated values are based on the parameters in Table 1 and 2, and the rate law described in the text.

T [°C]	[PBu_3] [M]	λ_1 [s^{-1}]	λ_2 [s^{-1}]	$\lambda_{1\ Calc}$ [s^{-1}]	$\lambda_{2\ Calc}$ [s^{-1}]
-10.0	0.0053	0.266	0.0119	0.292	0.0115
-10.0	0.0053	0.276	0.0118	0.292	0.0115
-10.0	0.0053	0.271	0.0116	0.292	0.0115
-10.0	0.0094	0.350	0.0115	0.347	0.0115
-10.0	0.0094	0.350	0.0115	0.347	0.0115
-10.0	0.0094	0.349	0.0114	0.347	0.0115
-10.0	0.0152	0.361	0.0115	0.383	0.0115
-10.0	0.0152	0.371	0.0113	0.383	0.0115
-10.0	0.0152	0.364	0.0114	0.383	0.0115
-10.0	0.0200	0.392	0.0112	0.398	0.0115
-10.0	0.0200	0.395	0.0128	0.398	0.0115
-10.0	0.0200	0.396	0.0113	0.398	0.0115
-10.0	0.0303	0.423	0.0117	0.417	0.0115
-10.0	0.0303	0.422	0.0116	0.417	0.0115
-10.0	0.0303	0.424	0.0117	0.417	0.0115
0.0	0.0053	0.686	0.0462	0.780	0.0480
0.0	0.0053	0.693	0.0460	0.780	0.0480
0.0	0.0053	0.690	0.0465	0.780	0.0480
0.0	0.0094	1.080	0.0490	1.003	0.0480
0.0	0.0094	1.100	0.0491	1.003	0.0480
0.0	0.0094	1.110	0.0484	1.003	0.0480
0.0	0.0152	1.220	0.0467	1.167	0.0480
0.0	0.0152	1.210	0.0472	1.167	0.0480
0.0	0.0152	1.210	0.0464	1.167	0.0480
0.0	0.0200	1.360	0.0482	1.247	0.0480
0.0	0.0200	1.350	0.0484	1.247	0.0480
0.0	0.0200	1.330	0.0484	1.247	0.0480
0.0	0.0303	1.322	0.0465	1.345	0.0480
0.0	0.0303	1.297	0.0467	1.345	0.0480
0.0	0.0303	1.297	0.0464	1.345	0.0480
10.0	0.0053	1.790	0.1870	1.795	0.1814
10.0	0.0053	1.810	0.1830	1.795	0.1814
10.0	0.0094	2.740	0.1840	2.501	0.1814
10.0	0.0094	2.730	0.1840	2.501	0.1814
10.0	0.0094	2.790	0.1830	2.501	0.1814
10.0	0.0152	3.150	0.1790	3.096	0.1814
10.0	0.0152	3.190	0.1790	3.096	0.1814
10.0	0.0152	3.100	0.1790	3.096	0.1814
10.0	0.0200	3.510	0.1840	3.413	0.1814
10.0	0.0200	3.640	0.1850	3.413	0.1814
10.0	0.0200	3.690	0.1850	3.413	0.1814
10.0	0.0303	3.740	0.1800	3.837	0.1814
10.0	0.0303	3.810	0.1790	3.837	0.1814
10.0	0.0303	3.740	0.1790	3.837	0.1814
15.0	0.0053	2.620	0.3420	2.600	0.3407
15.0	0.0053	2.720	0.3370	2.600	0.3407
15.0	0.0053	2.650	0.3390	2.600	0.3407
15.0	0.0094	4.040	0.3460	3.755	0.3407
15.0	0.0094	3.750	0.3450	3.755	0.3407
15.0	0.0094	3.850	0.3400	3.755	0.3407
15.0	0.0152	4.920	0.3390	4.796	0.3407
15.0	0.0152	4.840	0.3360	4.796	0.3407
15.0	0.0152	4.910	0.3400	4.796	0.3407
15.0	0.0200	5.670	0.3460	5.380	0.3407
15.0	0.0200	5.570	0.3470	5.380	0.3407
15.0	0.0200	5.670	0.3470	5.380	0.3407
15.0	0.0303	6.510	0.3410	6.190	0.3407
15.0	0.0303	6.330	0.3390	6.190	0.3407
15.0	0.0303	6.460	0.3410	6.190	0.3407

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20.0	0.0053	3.570	0.6290	3.669	0.6267
20.0	0.0053	3.580	0.6320	3.669	0.6267
20.0	0.0053	3.570	0.6290	3.669	0.6267
20.0	0.0094	5.670	0.6280	5.472	0.6267
20.0	0.0094	5.710	0.6260	5.472	0.6267
20.0	0.0094	5.860	0.6190	5.472	0.6267
20.0	0.0152	7.380	0.6250	7.203	0.6267
20.0	0.0152	7.360	0.6240	7.203	0.6267
20.0	0.0152	7.270	0.6260	7.203	0.6267
20.0	0.0200	8.730	0.6410	8.221	0.6267
20.0	0.0200	8.480	0.6380	8.221	0.6267
20.0	0.0200	8.330	0.6390	8.221	0.6267
20.0	0.0303	9.920	0.6250	9.695	0.6267
20.0	0.0303	9.540	0.6310	9.695	0.6267
25.0	0.0053	5.100	1.1500	5.060	1.1295
25.0	0.0053	5.000	1.1200	5.060	1.1295
25.0	0.0053	5.080	1.1400	5.060	1.1295
25.0	0.0094	7.980	1.1300	7.764	1.1295
25.0	0.0094	7.600	1.1200	7.764	1.1295
25.0	0.0094	7.880	1.1300	7.764	1.1295
25.0	0.0152	10.700	1.1400	10.512	1.1295
25.0	0.0152	10.500	1.1300	10.512	1.1295
25.0	0.0152	10.600	1.1300	10.512	1.1295
25.0	0.0200	12.000	1.1500	12.201	1.1295
25.0	0.0200	12.400	1.1500	12.201	1.1295
25.0	0.0200	12.500	1.1500	12.201	1.1295
25.0	0.0303	13.700	1.1200	14.753	1.1295
25.0	0.0303	14.200	1.1100	14.753	1.1295
25.0	0.0303	14.300	1.1200	14.753	1.1295
30.0	0.0053	6.880	1.9400	6.843	1.9973
30.0	0.0053	6.950	1.9100	6.843	1.9973
30.0	0.0053	6.880	1.9300	6.843	1.9973
30.0	0.0094	11.300	2.0300	10.759	1.9973
30.0	0.0094	11.100	2.0400	10.759	1.9973
30.0	0.0094	10.700	2.0200	10.759	1.9973
30.0	0.0152	15.000	1.9900	14.943	1.9973
30.0	0.0152	14.500	1.9700	14.943	1.9973
30.0	0.0152	14.800	1.9900	14.943	1.9973
30.0	0.0200	16.800	2.0100	17.623	1.9973
30.0	0.0200	16.500	2.0200	17.623	1.9973
30.0	0.0200	17.100	2.0200	17.623	1.9973
30.0	0.0303	18.800	2.0000	21.840	1.9973
30.0	0.0303	20.500	1.9900	21.840	1.9973
30.0	0.0303	18.800	2.0000	21.840	1.9973

Supporting Table S2. Kinetic data for the concentration and temperature dependence of the reaction of [Ru(η^5-C_5H_5)(η^4-C_5H_4O)(CH_3CN)]CF_3SO_3 (**2**) with PMe_3 in acetone. The λ values represent the observed pseudo-first order rate constants and the A values are their amplitudes. The calculated values are based on the parameters in Table 1 and 2, and the rate law described in the text.

T [°C]	PMe_3 mM	λ_1 obs [s^{-1}]	λ_2 obs [s^{-1}]	A_1/A_2 obs	λ_1 calc [s^{-1}]	λ_2 calc [s^{-1}]	A_1/A_2 calc
10.3	5	4.13	0.337	0.914	4.62	0.302	0.794
10.3	5	4.07	0.331	0.918	4.62	0.302	0.794
10.3	5	4.18	0.333	0.908	4.62	0.302	0.794
10.3	5	4.12	0.331	0.924	4.62	0.302	0.794
10.3	5	4.04	0.327	0.931	4.62	0.302	0.794
10.3	5	4.08	0.332	0.925	4.62	0.302	0.794
10.3	5	4.12	0.330	0.933	4.62	0.302	0.794
10.3	5	4.12	0.334	0.913	4.62	0.302	0.794
10.3	10	7.77	0.303	1.136	8.90	0.313	0.919
10.3	10	8.20	0.306	1.116	8.90	0.313	0.919

10.3	10	8.00	0.303	1.121	8.90	0.313	0.919
10.3	10	8.11	0.307	1.121	8.90	0.313	0.919
10.3	10	8.12	0.344	1.124	8.90	0.313	0.919
10.3	15	13.63	0.323	1.257	13.18	0.317	0.965
10.3	15	13.48	0.318	1.258	13.18	0.317	0.965
10.3	15	13.34	0.318	1.272	13.18	0.317	0.965
10.3	15	13.42	0.318	1.265	13.18	0.317	0.965
10.3	15	13.35	0.322	1.253	13.18	0.317	0.965
10.3	15	13.16	0.317	1.273	13.18	0.317	0.965
10.3	15	13.36	0.320	1.256	13.18	0.317	0.965
10.3	15	13.28	0.322	1.254	13.18	0.317	0.965
10.3	15	13.17	0.317	1.265	13.18	0.317	0.965
10.3	15	13.45	0.322	1.253	13.18	0.317	0.965
10.3	20	17.53	0.307	1.207	17.47	0.319	0.989
10.3	20	17.93	0.316	1.217	17.47	0.319	0.989
10.3	20	17.56	0.314	1.229	17.47	0.319	0.989
10.3	20	17.71	0.315	1.227	17.47	0.319	0.989
10.3	20	17.65	0.315	1.229	17.47	0.319	0.989
10.3	20	17.79	0.311	1.222	17.47	0.319	0.989
10.3	20	17.58	0.311	1.230	17.47	0.319	0.989
10.3	30	23.53	0.270	1.158	26.05	0.321	1.013
10.3	30	24.50	0.289	1.175	26.05	0.321	1.013
10.3	30	24.40	0.292	1.173	26.05	0.321	1.013
10.3	30	24.23	0.299	1.176	26.05	0.321	1.013
10.3	30	24.42	0.298	1.178	26.05	0.321	1.013
10.3	30	24.13	0.300	1.175	26.05	0.321	1.013
10.3	30	24.03	0.304	1.185	26.05	0.321	1.013
10.3	40	34.28	0.314	1.293	34.63	0.322	1.026
10.3	40	34.85	0.312	1.316	34.63	0.322	1.026
10.3	40	35.21	0.318	1.317	34.63	0.322	1.026
10.3	40	34.32	0.320	1.328	34.63	0.322	1.026
10.3	40	34.85	0.314	1.321	34.63	0.322	1.026
10.3	40	34.86	0.322	1.309	34.63	0.322	1.026
10.3	40	34.62	0.317	1.331	34.63	0.322	1.026
10.3	40	34.39	0.314	1.322	34.63	0.322	1.026
10.3	40	34.98	0.318	1.334	34.63	0.322	1.026
10.3	60	49.60	0.287	1.204	51.80	0.323	1.038
10.3	60	48.87	0.303	1.228	51.80	0.323	1.038
10.3	60	48.89	0.328	1.257	51.80	0.323	1.038
10.3	60	48.59	0.309	1.237	51.80	0.323	1.038
10.3	60	49.36	0.306	1.240	51.80	0.323	1.038
10.3	60	49.51	0.307	1.241	51.80	0.323	1.038
10.3	80	66.68	0.318	1.355	68.96	0.323	1.045
10.3	80	68.05	0.319	1.344	68.96	0.323	1.045
10.3	80	67.23	0.327	1.342	68.96	0.323	1.045
10.3	80	66.12	0.315	1.358	68.96	0.323	1.045
10.3	80	67.23	0.315	1.356	68.96	0.323	1.045
10.3	80	66.50	0.318	1.359	68.96	0.323	1.045
10.3	80	68.22	0.319	1.363	68.96	0.323	1.045
10.3	80	64.57	0.320	1.354	68.96	0.323	1.045
10.3	80	66.78	0.314	1.356	68.96	0.323	1.045
19.8	5	8.27	1.111	0.481	6.99	0.942	0.528
19.8	5	8.10	1.122	0.473	6.99	0.942	0.528
19.8	5	7.43	1.060	0.517	6.99	0.942	0.528
19.8	5	8.48	1.132	0.473	6.99	0.942	0.528

19.8	5	8.20	1.118	0.486	6.99	0.942	0.528
19.8	5	7.99	1.126	0.489	6.99	0.942	0.528
19.8	5	7.87	1.115	0.496	6.99	0.942	0.528
19.8	5	8.07	1.128	0.472	6.99	0.942	0.528
19.8	10	13.50	1.017	0.898	12.79	1.030	0.749
19.8	10	12.91	1.023	0.930	12.79	1.030	0.749
19.8	10	13.41	1.042	0.898	12.79	1.030	0.749
19.8	10	13.85	1.105	0.877	12.79	1.030	0.749
19.8	10	13.84	1.072	0.876	12.79	1.030	0.749
19.8	10	13.43	1.052	0.911	12.79	1.030	0.749
19.8	10	13.42	1.016	0.924	12.79	1.030	0.749
19.8	15	20.02	1.102	0.985	18.64	1.060	0.842
19.8	15	20.05	1.096	0.985	18.64	1.060	0.842
19.8	15	19.98	1.054	1.006	18.64	1.060	0.842
19.8	15	20.05	1.083	0.991	18.64	1.060	0.842
19.8	15	19.45	1.058	1.020	18.64	1.060	0.842
19.8	15	19.64	1.038	1.022	18.64	1.060	0.842
19.8	15	19.78	1.052	1.018	18.64	1.060	0.842
19.8	20	27.25	1.048	1.065	24.51	1.075	0.893
19.8	20	26.38	1.058	1.045	24.51	1.075	0.893
19.8	20	26.35	1.086	1.056	24.51	1.075	0.893
19.8	20	26.11	1.049	1.064	24.51	1.075	0.893
19.8	20	26.59	1.054	1.066	24.51	1.075	0.893
19.8	20	25.74	1.062	1.065	24.51	1.075	0.893
19.8	20	26.96	1.089	1.018	24.51	1.075	0.893
19.8	20	26.53	1.086	1.042	24.51	1.075	0.893
19.8	30	39.95	1.002	1.142	36.26	1.090	0.947
19.8	30	40.10	1.047	1.130	36.26	1.090	0.947
19.8	30	40.87	1.046	1.117	36.26	1.090	0.947
19.8	30	39.98	1.055	1.122	36.26	1.090	0.947
19.8	30	40.24	1.058	1.114	36.26	1.090	0.947
19.8	30	39.71	1.049	1.123	36.26	1.090	0.947
19.8	30	39.81	1.050	1.127	36.26	1.090	0.947
19.8	30	39.88	1.047	1.111	36.26	1.090	0.947
19.8	30	40.25	1.066	1.104	36.26	1.090	0.947
19.8	40	53.01	1.030	1.162	48.01	1.098	0.975
19.8	40	52.68	1.036	1.161	48.01	1.098	0.975
19.8	40	51.47	1.030	1.157	48.01	1.098	0.975
19.8	40	51.48	1.051	1.159	48.01	1.098	0.975
19.8	40	52.20	1.073	1.140	48.01	1.098	0.975
19.8	40	52.92	1.075	1.142	48.01	1.098	0.975
19.8	40	51.48	1.062	1.140	48.01	1.098	0.975
19.8	40	52.96	1.071	1.132	48.01	1.098	0.975
19.8	60	76.72	1.047	1.174	71.54	1.105	1.004
19.8	60	74.49	1.053	1.171	71.54	1.105	1.004
19.8	60	76.75	1.031	1.176	71.54	1.105	1.004
19.8	60	76.34	1.042	1.173	71.54	1.105	1.004
19.8	60	75.27	1.042	1.175	71.54	1.105	1.004
19.8	60	76.34	1.054	1.171	71.54	1.105	1.004
19.8	60	76.05	1.047	1.153	71.54	1.105	1.004
19.8	60	76.64	1.039	1.166	71.54	1.105	1.004
19.8	80	89.62	1.052	1.185	95.06	1.109	1.019
19.8	80	98.66	1.058	1.205	95.06	1.109	1.019
19.8	80	100.66	1.061	1.206	95.06	1.109	1.019
19.8	80	98.85	1.073	1.182	95.06	1.109	1.019

19.8	80	100.98	1.056	1.180	95.06	1.109	1.019
19.8	80	99.25	1.048	1.189	95.06	1.109	1.019
25.0	5	11.04	1.836	0.247	9.12	1.622	0.352
25.0	5	10.16	1.798	0.255	9.12	1.622	0.352
25.0	5	10.32	1.802	0.262	9.12	1.622	0.352
25.0	5	11.00	1.814	0.250	9.12	1.622	0.352
25.0	5	9.69	1.786	0.282	9.12	1.622	0.352
25.0	5	10.15	1.808	0.254	9.12	1.622	0.352
25.0	5	9.99	1.806	0.274	9.12	1.622	0.352
25.0	5	9.66	1.791	0.289	9.12	1.622	0.352
25.0	10	19.34	1.934	0.702	15.80	1.872	0.610
25.0	10	18.15	1.860	0.742	15.80	1.872	0.610
25.0	10	18.53	1.882	0.738	15.80	1.872	0.610
25.0	10	18.17	1.836	0.760	15.80	1.872	0.610
25.0	10	18.49	1.902	0.726	15.80	1.872	0.610
25.0	10	18.54	1.907	0.718	15.80	1.872	0.610
25.0	10	18.40	1.909	0.719	15.80	1.872	0.610
25.0	10	18.98	1.950	0.703	15.80	1.872	0.610
25.0	15	24.27	1.901	0.823	22.65	1.959	0.735
25.0	15	24.39	1.895	0.825	22.65	1.959	0.735
25.0	15	23.72	1.875	0.835	22.65	1.959	0.735
25.0	15	23.97	1.865	0.832	22.65	1.959	0.735
25.0	15	23.37	1.885	0.854	22.65	1.959	0.735
25.0	15	24.26	1.877	0.832	22.65	1.959	0.735
25.0	15	23.45	1.879	0.841	22.65	1.959	0.735
25.0	15	22.93	1.852	0.850	22.65	1.959	0.735
25.0	15	23.62	1.882	0.841	22.65	1.959	0.735
25.0	20	30.01	1.807	0.889	29.54	2.003	0.807
25.0	20	30.11	1.787	0.897	29.54	2.003	0.807
25.0	20	30.19	1.790	0.914	29.54	2.003	0.807
25.0	20	30.75	1.817	0.892	29.54	2.003	0.807
25.0	20	30.53	1.830	0.890	29.54	2.003	0.807
25.0	20	29.55	1.796	0.898	29.54	2.003	0.807
25.0	20	29.72	1.821	0.895	29.54	2.003	0.807
25.0	20	29.90	1.799	0.892	29.54	2.003	0.807
25.0	30	47.90	1.822	1.012	43.37	2.046	0.885
25.0	30	47.79	1.856	0.994	43.37	2.046	0.885
25.0	30	47.56	1.861	0.992	43.37	2.046	0.885
25.0	30	49.08	1.876	0.973	43.37	2.046	0.885
25.0	30	48.87	1.881	0.983	43.37	2.046	0.885
25.0	30	48.88	1.861	0.984	43.37	2.046	0.885
25.0	30	48.80	1.890	0.982	43.37	2.046	0.885
25.0	30	49.32	1.857	0.985	43.37	2.046	0.885
25.0	40	60.38	1.807	0.990	57.22	2.068	0.927
25.0	40	59.50	1.797	0.972	57.22	2.068	0.927
25.0	40	60.83	1.786	0.971	57.22	2.068	0.927
25.0	40	60.58	1.814	0.965	57.22	2.068	0.927
25.0	40	61.15	1.813	0.971	57.22	2.068	0.927
25.0	40	60.69	1.820	0.967	57.22	2.068	0.927
25.0	40	61.82	1.820	0.969	57.22	2.068	0.927
25.0	40	62.40	1.826	0.979	57.22	2.068	0.927
25.0	60	89.80	1.824	1.049	84.94	2.090	0.971
25.0	60	89.01	1.814	1.035	84.94	2.090	0.971
25.0	60	91.83	1.874	1.033	84.94	2.090	0.971
25.0	60	92.32	1.821	1.041	84.94	2.090	0.971

25.0	60	92.40	1.802	1.033	84.94	2.090	0.971
25.0	60	91.90	1.798	1.027	84.94	2.090	0.971
25.0	60	92.07	1.885	1.017	84.94	2.090	0.971
25.0	60	92.01	1.852	1.034	84.94	2.090	0.971
25.0	60	91.74	1.865	1.025	84.94	2.090	0.971
25.0	80	113.97	1.880	1.050	112.67	2.100	0.993
25.0	80	116.59	1.877	1.045	112.67	2.100	0.993
25.0	80	112.91	1.839	1.042	112.67	2.100	0.993
25.0	80	114.22	1.769	1.020	112.67	2.100	0.993
25.0	80	114.89	1.843	1.020	112.67	2.100	0.993
25.0	80	118.04	1.827	1.053	112.67	2.100	0.993
25.0	80	113.70	1.868	1.019	112.67	2.100	0.993
25.0	80	115.56	1.840	1.034	112.67	2.100	0.993
30.2	10	20.98	3.210	0.574	19.94	3.242	0.445
30.2	10	22.81	3.116	0.574	19.94	3.242	0.445
30.2	10	24.77	3.263	0.533	19.94	3.242	0.445
30.2	10	24.55	3.263	0.540	19.94	3.242	0.445
30.2	10	22.37	3.179	0.559	19.94	3.242	0.445
30.2	10	24.23	3.300	0.522	19.94	3.242	0.445
30.2	10	23.44	3.233	0.545	19.94	3.242	0.445
30.2	10	24.92	3.407	0.462	19.94	3.242	0.445
30.2	15	31.61	3.246	0.682	27.83	3.484	0.596
30.2	15	30.41	3.409	0.691	27.83	3.484	0.596
30.2	15	31.14	3.355	0.679	27.83	3.484	0.596
30.2	15	30.95	3.372	0.699	27.83	3.484	0.596
30.2	15	28.94	3.224	0.716	27.83	3.484	0.596
30.2	15	28.95	3.285	0.692	27.83	3.484	0.596
30.2	15	29.27	3.356	0.666	27.83	3.484	0.596
30.2	15	27.01	2.976	0.780	27.83	3.484	0.596
30.2	15	30.88	3.395	0.641	27.83	3.484	0.596
30.2	20	42.94	3.317	0.832	35.84	3.607	0.690
30.2	20	41.64	3.287	0.848	35.84	3.607	0.690
30.2	20	40.87	3.258	0.852	35.84	3.607	0.690
30.2	20	41.31	3.279	0.845	35.84	3.607	0.690
30.2	20	41.50	3.275	0.834	35.84	3.607	0.690
30.2	20	42.79	3.323	0.798	35.84	3.607	0.690
30.2	20	41.18	3.338	0.832	35.84	3.607	0.690
30.2	20	42.69	3.420	0.791	35.84	3.607	0.690
30.2	20	42.27	3.382	0.817	35.84	3.607	0.690
30.2	20	42.80	3.439	0.796	35.84	3.607	0.690
30.2	30	58.83	3.351	0.901	51.98	3.731	0.799
30.2	30	59.66	3.347	0.903	51.98	3.731	0.799
30.2	30	59.72	3.411	0.886	51.98	3.731	0.799
30.2	30	57.66	3.261	0.911	51.98	3.731	0.799
30.2	30	59.81	3.303	0.907	51.98	3.731	0.799
30.2	30	58.69	3.382	0.886	51.98	3.731	0.799
30.2	30	59.16	3.468	0.885	51.98	3.731	0.799
30.2	30	59.70	3.378	0.879	51.98	3.731	0.799
30.2	30	57.63	3.347	0.919	51.98	3.731	0.799
30.2	40	76.76	3.379	0.965	68.18	3.792	0.859
30.2	40	75.45	3.422	0.943	68.18	3.792	0.859
30.2	40	78.65	3.336	0.953	68.18	3.792	0.859
30.2	40	77.39	3.447	0.921	68.18	3.792	0.859
30.2	40	78.59	3.354	0.937	68.18	3.792	0.859
30.2	40	75.56	3.372	0.929	68.18	3.792	0.859

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30.2	40	79.66	3.395	0.943	68.18	3.792	0.859
30.2	40	75.72	3.435	0.940	68.18	3.792	0.859
30.2	40	78.21	3.212	0.928	68.18	3.792	0.859
30.2	40	79.36	3.410	0.919	68.18	3.792	0.859
30.2	60	117.69	3.374	0.947	100.65	3.853	0.923
30.2	60	111.58	3.352	1.005	100.65	3.853	0.923
30.2	60	116.77	3.397	0.987	100.65	3.853	0.923
30.2	60	115.30	3.275	0.991	100.65	3.853	0.923
30.2	60	113.15	3.383	0.982	100.65	3.853	0.923
30.2	60	113.32	3.431	0.979	100.65	3.853	0.923
30.2	60	115.28	3.325	0.968	100.65	3.853	0.923
30.2	60	117.70	3.464	0.981	100.65	3.853	0.923
30.2	60	113.58	3.330	0.969	100.65	3.853	0.923
30.2	80	146.43	3.320	1.027	133.15	3.884	0.956
30.2	80	148.91	3.362	0.997	133.15	3.884	0.956
30.2	80	148.38	3.309	1.018	133.15	3.884	0.956
30.2	80	144.22	3.375	1.031	133.15	3.884	0.956
30.2	80	148.05	3.302	1.043	133.15	3.884	0.956
30.2	80	144.02	3.228	1.025	133.15	3.884	0.956
30.2	80	145.10	3.410	1.007	133.15	3.884	0.956
30.2	80	147.97	3.433	0.991	133.15	3.884	0.956
30.2	80	147.87	3.383	1.014	133.15	3.884	0.956
40.0	5		5.408	0.032	26.07	5.049	0.026
40.0	5		5.466	0.026	26.07	5.049	0.026
40.0	5		5.447	0.018	26.07	5.049	0.026
40.0	5		5.493	0.027	26.07	5.049	0.026
40.0	5		5.446	0.027	26.07	5.049	0.026
40.0	5		5.506	0.025	26.07	5.049	0.026
40.0	5		5.415	0.030	26.07	5.049	0.026
40.0	5		5.469	0.031	26.07	5.049	0.026
40.0	5		5.513	0.028	26.07	5.049	0.026
40.0	5		5.538	0.027	26.07	5.049	0.026
40.0	10	40.80	8.061	0.210	34.27	7.683	0.151
40.0	10	60.45	8.891	0.121	34.27	7.683	0.151
40.0	10	57.75	8.891	0.127	34.27	7.683	0.151
40.0	10	50.68	8.827	0.142	34.27	7.683	0.151
40.0	10	57.66	8.835	0.133	34.27	7.683	0.151
40.0	10	64.22	9.020	0.118	34.27	7.683	0.151
40.0	10	73.72	8.956	0.115	34.27	7.683	0.151
40.0	10	62.84	9.146	0.105	34.27	7.683	0.151
40.0	10	62.59	8.988	0.117	34.27	7.683	0.151
40.0	15	51.41	9.509	0.297	43.75	9.025	0.286
40.0	15	55.89	10.141	0.255	43.75	9.025	0.286
40.0	15	70.90	10.848	0.210	43.75	9.025	0.286
40.0	15	56.58	9.822	0.257	43.75	9.025	0.286
40.0	15	59.49	10.252	0.255	43.75	9.025	0.286
40.0	15	67.41	10.753	0.219	43.75	9.025	0.286
40.0	15	61.76	10.311	0.235	43.75	9.025	0.286
40.0	15	52.37	9.561	0.277	43.75	9.025	0.286
40.0	15	59.30	10.019	0.236	43.75	9.025	0.286
40.0	15	58.31	9.933	0.247	43.75	9.025	0.286
40.0	20	61.22	9.583	0.461	53.83	9.782	0.399
40.0	20	63.31	9.763	0.442	53.83	9.782	0.399
40.0	20	63.10	9.486	0.456	53.83	9.782	0.399
40.0	20	65.53	9.556	0.434	53.83	9.782	0.399

40.0	20	64.68	9.581	0.453	53.83	9.782	0.399
40.0	20	65.60	9.810	0.427	53.83	9.782	0.399
40.0	20	63.96	9.738	0.426	53.83	9.782	0.399
40.0	20	68.12	9.851	0.422	53.83	9.782	0.399
40.0	30	76.84	9.427	0.549	74.70	10.573	0.556
40.0	30	79.84	10.015	0.522	74.70	10.573	0.556
40.0	30	68.09	9.016	0.601	74.70	10.573	0.556
40.0	30	83.10	10.046	0.509	74.70	10.573	0.556
40.0	30	73.45	9.473	0.548	74.70	10.573	0.556
40.0	30	79.70	9.783	0.533	74.70	10.573	0.556
40.0	30	70.14	9.706	0.543	74.70	10.573	0.556
40.0	30	80.82	9.959	0.527	74.70	10.573	0.556
40.0	30	80.97	9.855	0.526	74.70	10.573	0.556
40.0	40	110.63	9.636	0.686	95.96	10.974	0.657
40.0	40	108.53	9.621	0.674	95.96	10.974	0.657
40.0	40	112.40	9.685	0.655	95.96	10.974	0.657
40.0	40	111.69	9.647	0.646	95.96	10.974	0.657
40.0	40	107.82	9.731	0.662	95.96	10.974	0.657
40.0	40	110.55	9.528	0.671	95.96	10.974	0.657
40.0	40	106.29	9.531	0.665	95.96	10.974	0.657
40.0	40	103.89	9.246	0.684	95.96	10.974	0.657
40.0	40	108.62	9.583	0.668	95.96	10.974	0.657
40.0	40	106.22	9.557	0.660	95.96	10.974	0.657
40.0	60	150.75	9.372	0.734	138.88	11.374	0.774
40.0	60	153.44	9.463	0.730	138.88	11.374	0.774
40.0	60	152.51	9.213	0.722	138.88	11.374	0.774
40.0	60	153.62	9.441	0.740	138.88	11.374	0.774
40.0	60	158.51	9.338	0.729	138.88	11.374	0.774
40.0	60	160.03	9.457	0.729	138.88	11.374	0.774
40.0	60	153.85	9.329	0.699	138.88	11.374	0.774
40.0	60	152.13	9.148	0.698	138.88	11.374	0.774
40.0	60	158.16	9.281	0.717	138.88	11.374	0.774
40.0	80	207.61	9.047	0.801	182.00	11.572	0.839
40.0	80	187.22	8.802	0.759	182.00	11.572	0.839
40.0	80	194.74	8.783	0.746	182.00	11.572	0.839
40.0	80	198.71	8.817	0.768	182.00	11.572	0.839
40.0	80	183.47	8.544	0.739	182.00	11.572	0.839
40.0	80	197.34	8.922	0.738	182.00	11.572	0.839
40.0	80	190.30	8.687	0.721	182.00	11.572	0.839
40.0	80	199.40	8.671	0.736	182.00	11.572	0.839
51.5	10		17.387		80.71	15.248	0.001
51.5	10		17.904		80.71	15.248	0.001
51.5	10		17.531		80.71	15.248	0.001
51.5	10		17.640		80.71	15.248	0.001
51.5	15		21.704		90.38	20.425	0.038
51.5	15		21.529	0.054	90.38	20.425	0.038
51.5	15		22.067		90.38	20.425	0.038
51.5	15		21.846	0.051	90.38	20.425	0.038
51.5	15		21.823	0.038	90.38	20.425	0.038
51.5	15		21.625	0.041	90.38	20.425	0.038
51.5	20		27.076	0.119	101.37	24.280	0.090
51.5	20		27.969	0.111	101.37	24.280	0.090
51.5	20		27.570	0.115	101.37	24.280	0.090
51.5	20		28.972	0.105	101.37	24.280	0.090
51.5	20		27.671	0.127	101.37	24.280	0.090

51.5	20		28.889	0.105	101.37	24.280	0.090
51.5	20		28.900	0.095	101.37	24.280	0.090
51.5	30		29.537	0.232	126.05	29.288	0.208
51.5	30		28.146	0.248	126.05	29.288	0.208
51.5	30		28.378	0.256	126.05	29.288	0.208
51.5	30		27.869	0.247	126.05	29.288	0.208
51.5	30		29.199	0.227	126.05	29.288	0.208
51.5	30		27.102	0.268	126.05	29.288	0.208
51.5	30		26.178	0.305	126.05	29.288	0.208
51.5	40	185.70	30.652	0.333	152.82	32.210	0.317
51.5	40	113.11	27.406	0.445	152.82	32.210	0.317
51.5	40	176.37	31.028	0.348	152.82	32.210	0.317
51.5	40	183.73	30.483	0.325	152.82	32.210	0.317
51.5	40	172.63	28.758	0.388	152.82	32.210	0.317
51.5	40	228.75	31.979	0.342	152.82	32.210	0.317
51.5	40	180.86	31.634	0.358	152.82	32.210	0.317
51.5	60	257.87	31.347	0.457	209.11	35.311	0.482
51.5	60	280.93	31.215	0.526	209.11	35.311	0.482
51.5	60	191.98	29.242	0.522	209.11	35.311	0.482
51.5	60	150.01	28.422	0.467	209.11	35.311	0.482
51.5	60	211.42	30.593	0.484	209.11	35.311	0.482
51.5	60	197.26	29.151	0.523	209.11	35.311	0.482
51.5	60	168.27	29.175	0.454	209.11	35.311	0.482
51.5	60	249.64	30.791	0.482	209.11	35.311	0.482
51.5	80	302.19	30.972	0.572	266.92	36.884	0.592
51.5	80	290.91	30.731	0.559	266.92	36.884	0.592
51.5	80	372.78	31.519	0.539	266.92	36.884	0.592
51.5	80	303.07	31.001	0.495	266.92	36.884	0.592
51.5	80	208.32	29.968	0.451	266.92	36.884	0.592
51.5	80	346.43	30.907	0.530	266.92	36.884	0.592
51.5	80	231.54	29.740	0.517	266.92	36.884	0.592
51.5	80	248.80	30.957	0.469	266.92	36.884	0.592

Supporting Table S3. Kinetic data for the concentration and temperature dependence of the reaction of [Ru(η^5-C_5H_5)(η^4-C_5H_4O)(CH_3CN)]CF_3SO_3 (**2**) with PPr_3 in acetone. The λ values represent the observed pseudo-first order rate constants and the A values are their amplitudes. The calculated values are based on the parameters in Table 1 and the rate law described in the text.

T [°C]	PPr_3 [M]	λ_1 obs [s^{-1}]	λ_2 obs [s^{-1}]	A_1/A_2 obs	λ_1 calc [s^{-1}]	λ_2 calc [s^{-1}]	A_1/A_2 calc
-15.0	0.0292	4.080	0.0182	-0.306	3.62	0.0168	-0.278
-15.0	0.0292	3.910	0.0179	-0.303	3.62	0.0168	-0.278
-15.0	0.00574	0.761	0.0177	-0.268	0.71	0.0167	-0.291
-15.0	0.00574	0.737	0.0176	-0.280	0.71	0.0167	-0.291
-15.0	0.011	1.320	0.0175	-0.287	1.37	0.0168	-0.283
-15.0	0.00574	0.778	0.0175	-0.278	0.71	0.0167	-0.291
-15.0	0.011	1.380	0.0174	-0.276	1.37	0.0168	-0.283
-15.0	0.0539	6.540	0.0168	-0.285	6.68	0.0168	-0.276
-15.0	0.0539	6.460	0.0170	-0.273	6.68	0.0168	-0.276
-15.0	0.0539	6.460	0.0170	-0.273	6.68	0.0168	-0.276
-15.0	0.0292	3.710	0.0171	-0.304	3.62	0.0168	-0.278
-15.0	0.00574	0.779	0.0173	-0.266	0.71	0.0167	-0.291
-15.0	0.011	1.340	0.0173	-0.286	1.37	0.0168	-0.283
-15.0	0.00574	0.677	0.0171	-0.285	0.71	0.0167	-0.291
-10.0	0.011	1.740	0.0365	-0.297	1.67	0.0347	-0.289
-10.0	0.011	1.620	0.0360	-0.294	1.67	0.0347	-0.289
-10.0	0.0292	5.640	0.0357	-0.291	4.41	0.0348	-0.280
-10.0	0.00574	0.905	0.0355	-0.279	0.87	0.0345	-0.301

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-10.0	0.011	1.540	0.0352	-0.296	1.67	0.0347	-0.289
-10.0	0.0539	8.950	0.0325	-0.281	8.13	0.0348	-0.278
-10.0	0.0539	8.170	0.0337	-0.260	8.13	0.0348	-0.278
-10.0	0.00574	0.829	0.0343	-0.288	0.87	0.0345	-0.301
-10.0	0.0292	4.770	0.0349	-0.275	4.41	0.0348	-0.280
-10.0	0.0539	9.750	0.0348	-0.273	8.13	0.0348	-0.278
-10.0	0.00574	0.873	0.0343	-0.274	0.87	0.0345	-0.301
0.0	0.011	2.310	0.1400	-0.328	2.45	0.1361	-0.312
0.0	0.00574	1.190	0.1390	-0.360	1.30	0.1337	-0.343
0.0	0.011	2.280	0.1390	-0.324	2.45	0.1361	-0.312
0.0	0.00574	1.260	0.1380	-0.348	1.30	0.1337	-0.343
0.0	0.011	2.170	0.1360	-0.325	2.45	0.1361	-0.312
0.0	0.00574	1.200	0.1350	-0.348	1.30	0.1337	-0.343
0.0	0.0539	11.200	0.1080	-0.309	11.81	0.1381	-0.282
0.0	0.0292	5.840	0.1170	-0.340	6.42	0.1377	-0.289
0.0	0.0539	11.800	0.1170	-0.307	11.81	0.1381	-0.282
0.0	0.0292	6.200	0.1280	-0.338	6.42	0.1377	-0.289
0.0	0.0292	6.200	0.1280	-0.338	6.42	0.1377	-0.289
0.0	0.0539	11.000	0.1250	-0.287	11.81	0.1381	-0.282
10.0	0.011	3.450	0.4960	-0.375	3.60	0.4719	-0.360
10.0	0.011	3.530	0.4940	-0.374	3.60	0.4719	-0.360
10.0	0.011	3.070	0.4900	-0.387	3.60	0.4719	-0.360
10.0	0.0292	9.060	0.4820	-0.350	9.20	0.4900	-0.310
10.0	0.0292	8.800	0.4800	-0.351	9.20	0.4900	-0.310
10.0	0.0539	15.000	0.4730	-0.277	16.83	0.4947	-0.294
10.0	0.0292	8.420	0.4450	-0.352	9.20	0.4900	-0.310
10.0	0.00574	2.180	0.4530	-0.410	2.01	0.4420	-0.416
10.0	0.00574	2.160	0.4550	-0.408	2.01	0.4420	-0.416
10.0	0.0539	16.700	0.4720	-0.277	16.83	0.4947	-0.294
10.0	0.0539	15.000	0.4620	-0.280	16.83	0.4947	-0.294
10.0	0.00574	2.180	0.4570	-0.413	2.01	0.4420	-0.416
15.0	0.011	4.440	0.8910	-0.411	4.44	0.8287	-0.394
15.0	0.011	4.790	0.8750	-0.397	4.44	0.8287	-0.394
15.0	0.0539	18.800	0.8720	-0.277	19.99	0.9024	-0.304
15.0	0.0292	10.600	0.8720	-0.366	11.01	0.8876	-0.327
15.0	0.0292	10.800	0.8700	-0.366	11.01	0.8876	-0.327
15.0	0.0539	19.000	0.8620	-0.286	19.99	0.9024	-0.304
15.0	0.00574	2.920	0.7560	-0.398	2.62	0.7323	-0.446
15.0	0.00574	2.890	0.7660	-0.408	2.62	0.7323	-0.446
15.0	0.00574	2.800	0.7710	-0.414	2.62	0.7323	-0.446
15.0	0.0292	10.900	0.8560	-0.362	11.01	0.8876	-0.327
15.0	0.011	4.490	0.8560	-0.412	4.44	0.8287	-0.394
15.0	0.0539	18.200	0.8390	-0.285	19.99	0.9024	-0.304
25.0	0.011	9.220	2.1800	-0.462	7.56	2.1199	-0.436
20.0	0.0539	21.100	1.6000	-0.277	23.74	1.6048	-0.318
20.0	0.0539	21.000	1.5900	-0.292	23.74	1.6048	-0.318
20.0	0.0292	13.000	1.5500	-0.381	13.24	1.5592	-0.350
20.0	0.0292	13.600	1.5500	-0.374	13.24	1.5592	-0.350
20.0	0.0539	21.500	1.5400	-0.280	23.74	1.6048	-0.318
20.0	0.00574	3.790	1.1600	-0.408	3.67	1.1044	-0.442
20.0	0.00574	3.720	1.1800	-0.413	3.67	1.1044	-0.442
20.0	0.00574	3.750	1.1800	-0.409	3.67	1.1044	-0.442
20.0	0.011	6.230	1.4500	-0.433	5.65	1.3768	-0.425
20.0	0.0292	13.500	1.5100	-0.382	13.24	1.5592	-0.350
20.0	0.011	6.350	1.5000	-0.434	5.65	1.3768	-0.425
20.0	0.011	6.190	1.4800	-0.438	5.65	1.3768	-0.425
25.0	0.0539	29.400	2.8100	-0.293	28.28	2.7765	-0.337
25.0	0.0539	28.900	2.7200	-0.300	28.28	2.7765	-0.337
25.0	0.0292	17.600	2.6200	-0.387	16.10	2.6409	-0.377
25.0	0.0292	17.500	2.6100	-0.387	16.10	2.6409	-0.377
25.0	0.00574	5.430	1.7400	-0.377	5.55	1.5062	-0.390
25.0	0.0292	16.500	2.5600	-0.396	16.10	2.6409	-0.377
25.0	0.011	9.270	2.3100	-0.442	7.56	2.1199	-0.436
25.0	0.011	10.100	2.2400	-0.459	7.56	2.1199	-0.436
25.0	0.00574	4.900	1.6800	-0.399	5.55	1.5062	-0.390
25.0	0.00574	5.290	1.7500	-0.383	5.55	1.5062	-0.390

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Supporting Table S4. Kinetic data for the concentration and temperature dependence of the reaction of [Ru(η^5-C_5H_5)(η^4-C_5H_4O)(CH_3CN)]CF_3SO_3 (**2**) with PBu_3 in acetone. The λ values represent the observed pseudo-first order rate constants and the A values are their amplitudes. The calculated values are based on the parameters in Table 1 and the rate law described in the text.

T [°C]	PBu_3 [M]	λ_1 obs [s^{-1}]	λ_2 obs [s^{-1}]	A_1/A_2 obs	λ_1 calc [s^{-1}]	λ_2 calc [s^{-1}]	A_1/A_2 calc
-10.0	0.0025	0.529	0.0387	1.456	0.515	0.0384	0.960
-10.0	0.0025	0.515	0.0384	1.395	0.515	0.0384	0.960
-10.0	0.0040	0.825	0.0390	1.569	0.811	0.0390	1.052
-10.0	0.0040	0.845	0.0400	1.566	0.811	0.0390	1.052
-10.0	0.0040	0.822	0.0376	1.573	0.811	0.0390	1.052
-10.0	0.0060	1.227	0.0378	1.625	1.207	0.0394	1.105
-10.0	0.0060	1.247	0.0380	1.637	1.207	0.0394	1.105
-10.0	0.0080	1.616	0.0386	1.667	1.603	0.0395	1.132
-10.0	0.0080	1.704	0.0389	1.674	1.603	0.0395	1.132
-10.0	0.0080	1.665	0.0385	1.685	1.603	0.0395	1.132
-10.0	0.0100	2.122	0.0395	1.664	1.999	0.0396	1.149
-10.0	0.0100	2.091	0.0386	1.651	1.999	0.0396	1.149
-10.0	0.0100	2.063	0.0394	1.614	1.999	0.0396	1.149
-10.0	0.0150	3.148	0.0395	1.644	2.990	0.0397	1.171
-10.0	0.0150	3.133	0.0403	1.609	2.990	0.0397	1.171
-10.0	0.0150	3.150	0.0393	1.605	2.990	0.0397	1.171
-10.0	0.0200	4.184	0.0397	1.586	3.980	0.0398	1.183
-10.0	0.0200	4.334	0.0409	1.639	3.980	0.0398	1.183
-10.0	0.0200	4.272	0.0399	1.628	3.980	0.0398	1.183
0.0	0.0025	0.818	0.1430	0.851	0.875	0.1525	0.582
0.0	0.0040	1.270	0.1520	1.030	1.324	0.1614	0.777
0.0	0.0040	1.270	0.1510	1.050	1.324	0.1614	0.777
0.0	0.0040	1.280	0.1510	1.040	1.324	0.1614	0.777
0.0	0.0060	1.870	0.1580	1.170	1.929	0.1661	0.907
0.0	0.0060	1.910	0.1570	1.140	1.929	0.1661	0.907
0.0	0.0060	1.940	0.1580	1.160	1.929	0.1661	0.907
0.0	0.0080	2.550	0.1510	1.280	2.537	0.1684	0.978
0.0	0.0080	2.530	0.1600	1.250	2.537	0.1684	0.978
0.0	0.0080	2.500	0.1580	1.230	2.537	0.1684	0.978
0.0	0.0100	3.220	0.1580	1.260	3.145	0.1698	1.023
0.0	0.0100	3.320	0.1620	1.200	3.145	0.1698	1.023
0.0	0.0150	5.080	0.1640	1.320	4.669	0.1716	1.085
0.0	0.0150	5.020	0.1630	1.310	4.669	0.1716	1.085
0.0	0.0150	5.050	0.1630	1.330	4.669	0.1716	1.085
0.0	0.0200	6.530	0.1550	1.320	6.193	0.1725	1.117
0.0	0.0200	6.620	0.1159	1.290	6.193	0.1725	1.117
0.0	0.0200	6.620	0.1570	1.330	6.193	0.1725	1.117
10.0	0.0025	1.970	0.4380	0.149	1.794	0.4397	0.159
10.0	0.0025	1.990	0.4380	0.150	1.794	0.4397	0.159
10.0	0.0040	2.630	0.5150	0.291	2.390	0.5282	0.341
10.0	0.0040	2.590	0.5230	0.292	2.390	0.5282	0.341
10.0	0.0040	2.620	0.5200	0.293	2.390	0.5282	0.341
10.0	0.0060	3.500	0.5340	0.474	3.247	0.5832	0.527
10.0	0.0060	3.330	0.5380	0.467	3.247	0.5832	0.527
10.0	0.0060	3.290	0.5400	0.483	3.247	0.5832	0.527
10.0	0.0080	3.760	0.5470	0.579	4.131	0.6111	0.654
10.0	0.0080	3.930	0.5540	0.577	4.131	0.6111	0.654
10.0	0.0080	4.020	0.5610	0.558	4.131	0.6111	0.654
10.0	0.0100	4.930	0.5510	0.653	5.027	0.6279	0.743
10.0	0.0100	4.960	0.5520	0.665	5.027	0.6279	0.743
10.0	0.0100	5.180	0.5660	0.640	5.027	0.6279	0.743
10.0	0.0150	8.300	0.5720	0.765	7.285	0.6498	0.880
10.0	0.0150	8.030	0.5560	0.769	7.285	0.6498	0.880
10.0	0.0150	8.430	0.5690	0.760	7.285	0.6498	0.880
10.0	0.0200	10.900	0.5650	0.833	9.555	0.6606	0.956
10.0	0.0200	11.000	0.5730	0.832	9.555	0.6606	0.956

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10.0	0.0200	11.000	0.5740	0.820	9.555	0.6606	0.956
20.0	0.0025		0.9060		4.932	0.8395	0.018
20.0	0.0025		0.9000		4.932	0.8395	0.018
20.0	0.0025		0.8950		4.932	0.8395	0.018
20.0	0.0040		1.1500	0.111	5.581	1.1870	0.066
20.0	0.0040		1.1600	0.112	5.581	1.1870	0.066
20.0	0.0040		1.1700	0.114	5.581	1.1870	0.066
20.0	0.0060	6.440	1.5000	0.123	6.588	1.5082	0.155
20.0	0.0060	7.500	1.5300	0.110	6.588	1.5082	0.155
20.0	0.0060	6.350	1.5300	0.106	6.588	1.5082	0.155
20.0	0.0080	7.570	1.6400	0.230	7.706	1.7194	0.250
20.0	0.0080	7.550	1.6500	0.232	7.706	1.7194	0.250
20.0	0.0080	7.310	1.6300	0.226	7.706	1.7194	0.250
20.0	0.0100	10.500	1.7800	0.280	8.891	1.8627	0.340
20.0	0.0100	10.400	1.7800	0.289	8.891	1.8627	0.340
20.0	0.0100	10.300	1.7800	0.292	8.891	1.8627	0.340
20.0	0.0150	13.500	1.8400	0.438	12.006	2.0691	0.520
20.0	0.0150	13.300	1.8400	0.438	12.006	2.0691	0.520
20.0	0.0150	13.300	1.8500	0.454	12.006	2.0691	0.520
20.0	0.0200	15.700	1.8400	0.547	15.220	2.1761	0.646
20.0	0.0200	16.700	1.8600	0.553	15.220	2.1761	0.646
20.0	0.0200	16.800	1.8700	0.564	15.220	2.1761	0.646
30.0	0.0025		1.4700		15.293	1.2763	0.001
30.0	0.0040		2.2100		16.040	1.9470	0.009
30.0	0.0040		2.1800		16.040	1.9470	0.009
30.0	0.0040		2.1900		16.040	1.9470	0.009
30.0	0.0060		2.9800		17.145	2.7323	0.027
30.0	0.0060		3.0500		17.145	2.7323	0.027
30.0	0.0060		3.0100		17.145	2.7323	0.027
30.0	0.0080		3.7400		18.366	3.4007	0.053
30.0	0.0080		3.7400		18.366	3.4007	0.053
30.0	0.0080		3.7300		18.366	3.4007	0.053
30.0	0.0100	22.100	4.0800	0.100	19.692	3.9647	0.084
30.0	0.0100	20.100	4.0700	0.095	19.692	3.9647	0.084
30.0	0.0100	20.800	4.1000	0.098	19.692	3.9647	0.084
30.0	0.0150	23.900	4.8600	0.199	23.371	5.0109	0.178
30.0	0.0150	23.100	4.8400	0.211	23.371	5.0109	0.178
30.0	0.0150	23.000	4.8300	0.211	23.371	5.0109	0.178
30.0	0.0200	23.100	4.9800	0.346	27.410	5.6967	0.275
30.0	0.0200	27.200	4.8300	0.278	27.410	5.6967	0.275
30.0	0.0200	24.900	4.8800	0.309	27.410	5.6967	0.275
40.0	0.0025		2.0800		47.033	1.7757	0.001
40.0	0.0025		2.0800		47.033	1.7757	0.001
40.0	0.0025		2.0500		47.033	1.7757	0.001
40.0	0.0040		3.4200		47.998	2.7840	0.002
40.0	0.0040		3.3700		47.998	2.7840	0.002
40.0	0.0040		3.3600		47.998	2.7840	0.002
40.0	0.0060		4.6800		49.352	4.0614	0.006
40.0	0.0060		4.7000		49.352	4.0614	0.006
40.0	0.0060		4.7000		49.352	4.0614	0.006
40.0	0.0080		6.3700		50.782	5.2627	0.011
40.0	0.0080		6.3500		50.782	5.2627	0.011
40.0	0.0080		6.4100		50.782	5.2627	0.011
40.0	0.0100		7.4400		52.288	6.3890	0.019
40.0	0.0100		7.5100		52.288	6.3890	0.019
40.0	0.0100		7.5300		52.288	6.3890	0.019
40.0	0.0150		10.1000		56.365	8.8902	0.043
40.0	0.0150		9.9900		56.365	8.8902	0.043
40.0	0.0150		10.1000		56.365	8.8902	0.043
40.0	0.0200		12.3000		60.855	10.9791	0.075
40.0	0.0200		12.0000		60.855	10.9791	0.075
40.0	0.0200		11.9000		60.855	10.9791	0.075

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Supporting Table S5. Kinetic data for the concentration and temperature dependence of the reaction of [Ru(η^5-C_5H_5)(η^4-C_5H_4O)(CH_3CN)]CF_3SO_3 (**2**) with PMe_2Ph in acetone. The λ values represent the observed pseudo-first order rate constants. The calculated values are based on the parameters in Table 1 and the rate law described in the text.

T [°C]	[PMe_2Ph] [M]	λ_1 [s^{-1}]	λ_2 [s^{-1}]	λ_2 [s^{-1}]	λ_1 Calc [s^{-1}]	λ_2 Calc [s^{-1}]	λ_3 Calc [s^{-1}]
-10.0	0.00528	0.891	0.0090		0.938	0.0091	0.00014
-10.0	0.00528	0.905	0.0090		0.938	0.0091	0.00014
-10.0	0.00528	0.908	0.0090		0.938	0.0091	0.00014
-10.0	0.01130	1.770	0.0097		1.777	0.0103	0.00014
-10.0	0.01130	1.830	0.0098		1.777	0.0103	0.00014
-10.0	0.01130	1.850	0.0100		1.777	0.0103	0.00014
-10.0	0.02940	4.440	0.0116		4.303	0.0110	0.00014
-10.0	0.02940	4.440	0.0115		4.303	0.0110	0.00014
-10.0	0.02940	4.470	0.0117		4.303	0.0110	0.00014
-10.0	0.05010	7.240	0.0117		7.193	0.0112	0.00014
-10.0	0.05010	7.200	0.0117		7.193	0.0112	0.00014
-10.0	0.05010	6.880	0.0115		7.193	0.0112	0.00014
0.0	0.00528	2.070	0.0261		1.895	0.0290	0.00092
0.0	0.00528	2.190	0.0263		1.895	0.0290	0.00092
0.0	0.00528	2.180	0.0266		1.895	0.0290	0.00092
0.0	0.01130	3.320	0.0381	0.00169	3.131	0.0375	0.00092
0.0	0.01130	3.310	0.0380	0.00141	3.131	0.0375	0.00092
0.0	0.01130	3.390	0.0379	0.00118	3.131	0.0375	0.00092
0.0	0.02940	7.420	0.0436		6.866	0.0445	0.00092
0.0	0.02940	7.390	0.0438		6.866	0.0445	0.00092
0.0	0.02940	7.480	0.0439		6.866	0.0445	0.00092
0.0	0.05010	11.200	0.0477		11.143	0.0467	0.00092
0.0	0.05010	10.900	0.0475		11.143	0.0467	0.00092
0.0	0.05010	11.400	0.0477		11.143	0.0467	0.00092
5.0	0.00528	2.450	0.0461	0.00329	2.868	0.0462	0.00222
5.0	0.00528	2.370	0.0443	0.00201	2.868	0.0462	0.00222
5.0	0.00528	2.480	0.0444	0.00197	2.868	0.0462	0.00222
5.0	0.01130	4.610	0.0647	0.00212	4.348	0.0652	0.00222
5.0	0.01130	4.690	0.0648	0.00178	4.348	0.0652	0.00222
5.0	0.01130	4.500	0.0648	0.00206	4.348	0.0652	0.00222
5.0	0.02940	9.290	0.0844	0.00260	8.837	0.0835	0.00222
5.0	0.02940	9.400	0.0852	0.00297	8.837	0.0835	0.00222
5.0	0.02940	9.310	0.0857	0.00290	8.837	0.0835	0.00222
5.0	0.05010	13.700	0.1020	0.00320	13.985	0.0899	0.00222
5.0	0.05010	12.900	0.1010	0.00319	13.985	0.0899	0.00222
5.0	0.05010	13.300	0.1020	0.00316	13.985	0.0899	0.00222
10.0	0.00528		0.0680	0.00528	4.507	0.0689	0.00517
10.0	0.00528		0.0684	0.00532	4.507	0.0689	0.00517
10.0	0.01130	6.390	0.1070	0.00308	6.265	0.1060	0.00517
10.0	0.01130	6.230	0.1070	0.00339	6.265	0.1060	0.00517
10.0	0.01130	6.230	0.1050	0.00338	6.265	0.1060	0.00517
10.0	0.02940	12.300	0.1540	0.00636	11.618	0.1488	0.00517
10.0	0.02940	12.200	0.1540	0.00654	11.618	0.1488	0.00517
10.0	0.02940	12.500	0.1530	0.00626	11.618	0.1488	0.00517
10.0	0.05010	17.600	0.1760	0.00532	17.772	0.1657	0.00517
10.0	0.05010	17.000	0.1770	0.00542	17.772	0.1657	0.00517
10.0	0.05010	17.100	0.1780	0.00577	17.772	0.1657	0.00517
15.0	0.00528		0.0920	0.01520	7.294	0.0968	0.01173
15.0	0.00528		0.0902	0.01460	7.294	0.0968	0.01173
15.0	0.00528		0.0911	0.01230	7.294	0.0968	0.01173
15.0	0.01130	8.320	0.1660	0.00964	9.365	0.1614	0.01173
15.0	0.01130	8.530	0.1650	0.00942	9.365	0.1614	0.01173
15.0	0.01130	7.890	0.1640	0.00958	9.365	0.1614	0.01173
15.0	0.02940	17.100	0.2600	0.01180	15.697	0.2506	0.01173
15.0	0.02940	17.500	0.2560	0.00961	15.697	0.2506	0.01173
15.0	0.02940	17.100	0.2580	0.01040	15.697	0.2506	0.01173
15.0	0.05010	23.400	0.3020	0.01870	23.000	0.2914	0.01173
15.0	0.05010	23.000	0.3040	0.02200	23.000	0.2914	0.01173
15.0	0.05010	23.400	0.3040	0.02220	23.000	0.2914	0.01173

20.0	0.00528		0.1050	0.02860	12.023	0.1301	0.02585
20.0	0.00528		0.1090	0.02560	12.023	0.1301	0.02585
20.0	0.00528		0.1040	0.02790	12.023	0.1301	0.02585
20.0	0.01130	11.700	0.2200	0.02640	14.448	0.2317	0.02585
20.0	0.01130	8.420	0.2410	0.02570	14.448	0.2317	0.02585
20.0	0.01130	11.500	0.2190	0.02530	14.448	0.2317	0.02585
20.0	0.02940	23.100	0.4190	0.02810	21.880	0.3980	0.02585
20.0	0.02940	24.000	0.4170	0.02770	21.880	0.3980	0.02585
20.0	0.02940	23.900	0.4190	0.02740	21.880	0.3980	0.02585
20.0	0.05010	32.600	0.4880	0.02600	30.482	0.4868	0.02585
20.0	0.05010	33.900	0.4970	0.02830	30.482	0.4868	0.02585
20.0	0.05010	33.400	0.4950	0.02640	30.482	0.4868	0.02585
25.0	0.00528		0.1730	0.05140	19.991	0.1688	0.05552
25.0	0.00528		0.1740	0.06210	19.991	0.1688	0.05552
25.0	0.01130	28.700	0.3520	0.06600	22.818	0.3164	0.05552
25.0	0.01130	27.600	0.3600	0.06420	22.818	0.3164	0.05552
25.0	0.01130	31.700	0.3440	0.06380	22.818	0.3164	0.05552
25.0	0.02940	38.500	0.6050	0.05900	31.481	0.5967	0.05552
25.0	0.02940	39.900	0.6080	0.05900	31.481	0.5967	0.05552
25.0	0.05010	44.900	0.7700	0.05650	41.535	0.7707	0.05552
25.0	0.02940	42.780	0.6130	0.06530	31.481	0.5967	0.05552
25.0	0.05010	51.300	0.7800	0.04600	41.535	0.7707	0.05552
25.0	0.05010	46.700	0.7790	0.06090	41.535	0.7707	0.05552

Supporting Table S6. Kinetic data for the concentration and temperature dependence of the reaction of $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(CH_3CN)]CF_3SO_3$ (**2**) with $PMePh_2$ in acetone. Metal attack.

T [°C]	$PMePh_2$ [M]	k_{obs} [s^{-1}]	A
-71,7	0,211	0,068	0,309
-71,7	0,211	0,073	0,317
-71,7	0,211	0,074	0,317
-71,7	0,211	0,074	0,320
-71,7	0,211	0,066	0,280
-71,7	0,211	0,072	0,310
-71,7	0,211	0,072	0,317
-71,5	0,013	0,009	0,158
-71,4	0,013	0,009	0,160
-71,4	0,013	0,009	0,158
-71,3	0,013	0,009	0,160
-71,3	0,013	0,009	0,160
-71,3	0,026	0,013	0,191
-71,3	0,026	0,013	0,191
-71,3	0,026	0,013	0,190
-71,2	0,026	0,013	0,190
-71,0	0,158	0,066	0,280
-71,0	0,158	0,066	0,290
-71,0	0,158	0,067	0,287
-71,0	0,158	0,066	0,290
-71,0	0,158	0,065	0,279
-71,0	0,158	0,065	0,284
-70,9	0,158	0,066	0,290
-70,8	0,105	0,045	0,244
-70,8	0,105	0,045	0,243
-70,8	0,105	0,045	0,247
-70,8	0,105	0,044	0,246
-70,8	0,105	0,044	0,244
-70,8	0,105	0,044	0,245
-70,8	0,105	0,044	0,244
-70,6	0,013	0,010	0,157
-70,4	0,053	0,024	0,168
-70,4	0,053	0,018	0,166
-70,4	0,053	0,019	0,166
-65,6	0,026	0,027	0,149
-65,6	0,026	0,027	0,149
-65,6	0,026	0,027	0,150
-65,6	0,026	0,026	0,150
-65,3	0,105	0,077	0,220
-65,3	0,105	0,077	0,220
-65,3	0,105	0,077	0,220
-65,3	0,105	0,077	0,220
-65,3	0,105	0,077	0,220
-65,3	0,105	0,076	0,220
-65,3	0,105	0,077	0,230
-65,2	0,211	0,137	0,310
-65,2	0,211	0,137	0,312
-65,2	0,211	0,136	0,312
-65,2	0,211	0,138	0,311
-65,2	0,211	0,129	0,308
-65,1	0,211	0,133	0,314
-65,1	0,211	0,134	0,317
-64,9	0,158	0,116	0,263
-64,9	0,158	0,110	0,266
-64,9	0,158	0,114	0,266
-64,9	0,158	0,114	0,267
-64,9	0,158	0,114	0,265
-64,9	0,158	0,114	0,260
-64,9	0,158	0,115	0,267

-64,9	0,158	0,114	0,269	-55,5	0,026	0,109	0,950
-64,6	0,013	0,024	0,088	-55,5	0,026	0,110	0,098
-64,6	0,013	0,024	0,091	-55,5	0,026	0,117	0,099
-64,6	0,013	0,023	0,094	-55,5	0,026	0,118	0,099
-64,6	0,013	0,022	0,094	-55,5	0,026	0,119	0,100
-64,6	0,013	0,023	0,093	-55,5	0,026	0,119	0,105
-64,6	0,013	0,023	0,094	-55,5	0,026	0,120	0,106
-61,1	0,105	0,120	0,200	-55,4	0,105	0,230	0,169
-61,1	0,105	0,120	0,200	-55,4	0,105	0,230	0,171
-61,1	0,105	0,122	0,200	-55,4	0,105	0,230	0,172
-61,1	0,105	0,120	0,200	-55,4	0,105	0,230	0,170
-61,1	0,105	0,120	0,200	-55,4	0,105	0,219	0,177
-61,1	0,105	0,120	0,210	-55,4	0,105	0,227	0,179
-61,1	0,105	0,120	0,200	-55,1	0,158	0,310	0,214
-60,6	0,158	0,174	0,246	-55,1	0,158	0,308	0,221
-60,6	0,158	0,178	0,250	-55,1	0,158	0,314	0,222
-60,6	0,158	0,175	0,245	-55,1	0,158	0,311	0,218
-60,6	0,158	0,174	0,244	-55,1	0,158	0,319	0,220
-60,6	0,158	0,174	0,250	-55,1	0,158	0,320	0,223
-60,6	0,158	0,177	0,250	-55,1	0,211	0,419	0,290
-60,6	0,158	0,175	0,250	-55,1	0,211	0,411	0,276
-60,6	0,158	0,177	0,252	-55,1	0,211	0,411	0,280
-60,5	0,026	0,056	0,120	-55,1	0,211	0,405	0,280
-60,5	0,026	0,057	0,120	-55,1	0,211	0,390	0,280
-60,4	0,013	0,043	0,054	-55,1	0,211	0,400	0,288
-60,3	0,013	0,042	0,062	-55,1	0,211	0,420	0,290
-60,3	0,026	0,057	0,120	-53,9	0,053	0,178	0,145
-60,3	0,026	0,053	0,127	-53,9	0,053	0,179	0,144
-60,3	0,026	0,058	0,129	-53,9	0,053	0,179	0,144
-60,3	0,026	0,062	0,129	-53,9	0,053	0,180	0,144
-60,3	0,211	0,232	0,295	-53,9	0,053	0,182	0,146
-60,3	0,211	0,234	0,300	-49,9	0,053	0,305	0,101
-60,3	0,211	0,236	0,300	-49,9	0,053	0,303	0,100
-60,3	0,211	0,233	0,300	-49,9	0,053	0,301	0,099
-60,3	0,211	0,217	0,300	-49,9	0,053	0,302	0,101
-60,3	0,211	0,224	0,307	-49,7	0,014	0,169	0,040
-60,3	0,211	0,233	0,312	-49,7	0,014	0,167	0,040
-60,2	0,013	0,044	0,065	-49,7	0,014	0,171	0,039
-60,2	0,013	0,044	0,066	-49,7	0,014	0,166	0,040
-60,2	0,013	0,045	0,068	-49,7	0,014	0,169	0,040
-60,2	0,013	0,047	0,070	-49,7	0,026	0,232	0,051
-60,2	0,013	0,047	0,071	-49,7	0,026	0,228	0,051
-60,2	0,013	0,047	0,070	-49,7	0,026	0,229	0,052
-60,2	0,013	0,047	0,070	-49,7	0,026	0,214	0,059
-60,2	0,013	0,047	0,071	-49,7	0,026	0,219	0,059
-60,1	0,053	0,084	0,177	-49,7	0,026	0,222	0,058
-60,1	0,053	0,087	0,180	-49,7	0,106	0,414	0,151
-60,1	0,053	0,086	0,179	-49,7	0,106	0,421	0,154
-60,1	0,053	0,086	0,180	-49,7	0,106	0,414	0,151
-55,5	0,013	0,087	0,050	-49,7	0,106	0,395	0,158
-55,5	0,013	0,089	0,052	-49,7	0,106	0,408	0,154
-55,5	0,013	0,090	0,052	-49,7	0,106	0,415	0,153
-55,5	0,013	0,090	0,055	-49,7	0,158	0,551	0,187
-55,5	0,013	0,090	0,056	-49,7	0,158	0,552	0,192
-55,5	0,013	0,090	0,056	-49,7	0,158	0,545	0,191

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-49,7	0,158	0,543	0,191	-40,8	0,026	0,713	0,026
-49,7	0,158	0,542	0,192	-40,8	0,026	0,699	0,028
-49,7	0,158	0,553	0,198	-40,8	0,053	0,923	0,072
-49,7	0,211	0,636	0,217	-40,8	0,053	0,912	0,074
-49,7	0,211	0,634	0,210	-40,8	0,053	0,923	0,077
-49,7	0,211	0,640	0,213	-40,8	0,053	0,925	0,076
-49,7	0,211	0,638	0,209	-40,8	0,053	0,924	0,080
-46,0	0,026	0,378	0,061	-40,8	0,105	1,260	0,081
-46,0	0,026	0,385	0,062	-40,8	0,105	1,230	0,083
-46,0	0,026	0,386	0,622	-40,8	0,105	1,210	0,084
-46,0	0,026	0,386	0,064	-40,8	0,105	1,260	0,081
-46,0	0,026	0,392	0,063	-40,8	0,105	1,240	0,078
-45,9	0,053	0,500	0,097	-40,8	0,158	1,450	0,090
-45,9	0,053	0,530	0,098	-40,8	0,158	1,420	0,096
-45,9	0,053	0,538	0,102	-40,8	0,158	1,390	0,094
-45,9	0,053	0,538	0,101	-40,8	0,158	1,390	0,095
-45,9	0,053	0,539	0,100	-40,8	0,158	1,410	0,097
-45,3	0,158	0,938	0,150	-40,8	0,158	1,440	0,094
-45,3	0,158	0,943	0,148	-40,8	0,211	1,680	0,127
-45,3	0,158	0,940	0,154	-40,8	0,211	1,730	0,131
-45,3	0,158	0,956	0,148	-40,8	0,211	1,710	0,128
-45,3	0,158	0,877	0,159	-40,8	0,211	1,710	0,127
-45,3	0,158	0,927	0,157	-40,8	0,211	1,750	0,131
-45,3	0,158	0,947	0,153	-34,9	0,053	1,530	0,056
-45,3	0,211	1,253	0,210	-34,9	0,053	1,550	0,057
-45,3	0,211	1,236	0,211	-34,9	0,053	1,490	0,057
-45,3	0,211	1,215	0,220	-34,9	0,053	1,510	0,058
-45,3	0,211	1,266	0,214	-34,9	0,053	1,650	0,058
-45,3	0,211	1,286	0,208	-34,9	0,053	1,670	0,057
-45,3	0,211	1,286	0,215	-30,3	0,026	2,470	0,010
-45,3	0,211	1,248	0,217	-30,3	0,026	2,350	0,007
-45,2	0,013	0,235	0,034	-30,3	0,026	3,350	0,008
-45,2	0,013	0,238	0,034	-30,3	0,026	3,460	0,007
-45,2	0,013	0,240	0,034	-30,3	0,026	3,580	0,007
-45,2	0,013	0,243	0,034	-30,3	0,079	3,250	0,012
-45,1	0,105	0,760	0,103	-30,3	0,079	3,820	0,012
-45,1	0,105	0,788	0,109	-30,3	0,079	3,000	0,015
-45,1	0,105	0,788	0,105	-30,3	0,079	2,910	0,014
-45,1	0,105	0,790	0,110	-30,3	0,079	3,280	0,013
-45,1	0,105	0,725	0,120	-30,3	0,079	2,660	0,015
-45,1	0,105	0,780	0,778	-30,3	0,079	2,700	0,016
-45,1	0,105	0,800	0,110	-30,3	0,106	3,880	0,053
-45,1	0,105	0,820	0,110	-30,3	0,106	3,960	0,053
-45,1	0,105	0,820	0,115	-30,3	0,106	4,010	0,053
-45,1	0,105	0,820	0,111	-30,3	0,106	3,820	0,056
-45,1	0,105	0,820	0,110	-30,3	0,106	3,970	0,055
-40,8	0,013	0,543	0,020	-30,3	0,106	4,220	0,051
-40,8	0,013	0,489	0,017	-30,3	0,106	3,870	0,053
-40,8	0,013	0,547	0,019	-30,3	0,158	6,260	0,039
-40,8	0,013	0,545	0,019	-30,3	0,158	6,820	0,040
-40,8	0,013	0,520	0,019	-30,3	0,158	6,630	0,041
-40,8	0,026	0,730	0,026	-30,3	0,158	5,820	0,042
-40,8	0,026	0,726	0,026	-30,3	0,158	5,490	0,045
-40,8	0,026	0,691	0,026	-30,3	0,158	5,920	0,042
-40,8	0,026	0,711	0,026	-30,3	0,158	5,940	0,043

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-30,3	0,158	6,580	0,043	-25,4	0,053	2,890	0,038
-30,3	0,158	5,880	0,045	-25,4	0,053	3,060	0,038
-30,3	0,211	5,710	0,074	-25,4	0,053	2,860	0,039
-30,3	0,211	5,310	0,080	-21,0	0,053	3,840	0,034
-30,3	0,211	5,600	0,078	-21,0	0,053	4,010	0,035
-30,3	0,211	5,320	0,082	-21,0	0,053	4,070	0,035
-30,3	0,211	5,690	0,079	-21,0	0,053	3,960	0,035
-30,3	0,211	5,750	0,079	-21,0	0,053	4,030	0,035
-30,3	0,211	5,460	0,081	-21,0	0,053	3,910	0,036
-25,4	0,053	2,830	0,037				

Supporting Table S7. Kinetic data for the concentration and temperature dependence of the reaction of [Ru(η^5-C_5H_5)(η^4-C_5H_4O)(pyridine)]CF_3SO_3 (**3**) with PMe_3 in acetone. Metal attack.

T [°C]	PMe_3 [mM]	k_{obs} [s^{-1}]	A
10.5	5	1.099	-0.0836
10.5	5	1.095	-0.0845
10.5	5	1.111	-0.0842
10.5	5	1.112	-0.0835
10.5	5	1.114	-0.0831
10.5	5	1.109	-0.0821
10.5	5	1.123	-0.0848
10.5	5	1.080	-0.0833
10.5	5	1.138	-0.0841
10.5	10	1.929	-0.0951
10.5	10	2.130	-0.0985
10.5	10	2.114	-0.0964
10.5	10	2.128	-0.0963
10.5	10	2.169	-0.0986
10.5	10	2.154	-0.0974
10.5	10	2.105	-0.0975
10.5	10	2.102	-0.0966
10.5	10	2.054	-0.0952
10.5	15	3.211	-0.0974
10.5	15	3.118	-0.1000
10.5	15	3.164	-0.0993
10.5	15	3.208	-0.1001
10.5	15	3.071	-0.0984
10.5	15	3.181	-0.1008
10.5	15	3.127	-0.0986
10.5	15	3.110	-0.0990
10.5	15	3.159	-0.0992
10.5	15	3.104	-0.0996
10.5	20	4.541	-0.1016
10.5	20	4.676	-0.1011
10.5	20	4.624	-0.1023
10.5	20	4.536	-0.1024
10.5	20	4.585	-0.1024
10.5	20	4.569	-0.1026
10.5	20	4.485	-0.1024
10.5	20	4.622	-0.1032
10.5	20	4.538	-0.1030
10.5	30	6.479	-0.1073
10.5	30	6.543	-0.1027
10.5	30	6.552	-0.1037
10.5	30	6.241	-0.1072
10.5	30	6.498	-0.1057
10.5	30	6.427	-0.1063
10.5	30	6.679	-0.1038
10.5	30	6.602	-0.1055
10.5	30	6.348	-0.1058
10.5	40	8.954	-0.1047
10.5	40	9.231	-0.1061
10.5	40	9.216	-0.1058
10.5	40	9.072	-0.1041
10.5	40	9.090	-0.1039
10.5	40	8.895	-0.1062
10.5	40	9.149	-0.1055
10.5	40	9.164	-0.1054
10.5	40	8.975	-0.1061
10.5	40	8.917	-0.1067
10.5	60	12.909	-0.1070
10.5	60	12.790	-0.1074
10.5	60	12.922	-0.1061
10.5	60	13.067	-0.1080
10.5	60	12.967	-0.1065
10.5	60	12.787	-0.1065
10.5	60	12.765	-0.1063
10.5	60	13.113	-0.1069
10.5	60	13.048	-0.1076
10.5	60	13.387	-0.1089
10.5	80	16.904	-0.1062
10.5	80	16.221	-0.1061
10.5	80	15.837	-0.1065
10.5	80	16.336	-0.1080
10.5	80	16.427	-0.1063
10.5	80	16.743	-0.1069
10.5	80	17.861	-0.1069
10.5	80	17.187	-0.1065
10.5	80	17.536	-0.1060
10.5	80	17.164	-0.1062
25.1	5	3.158	-0.0493

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25.1	5	3.265	-0.0505	25.1	80	32.002	-0.0922
25.1	5	3.157	-0.0492	25.1	80	31.706	-0.0911
25.1	5	3.232	-0.0503	25.1	80	31.169	-0.0936
25.1	5	3.102	-0.0508	25.1	80	31.931	-0.0919
25.1	5	3.186	-0.0496	25.1	80	32.164	-0.0910
25.1	5	3.285	-0.0485	25.1	80	31.568	-0.0920
25.1	5	3.198	-0.0499	40.1	10	15.150	-0.0394
25.1	5	3.278	-0.0507	40.1	10	15.846	-0.0393
25.1	5	3.216	-0.0501	40.1	10	16.057	-0.0394
25.1	5	3.254	-0.0497	40.1	10	14.866	-0.0400
25.1	15	6.622	-0.0761	40.1	10	15.680	-0.0411
25.1	15	6.785	-0.0757	40.1	10	14.515	-0.0384
25.1	15	6.829	-0.0753	40.1	10	14.936	-0.0382
25.1	15	6.895	-0.0763	40.1	10	14.237	-0.0380
25.1	15	6.776	-0.0756	40.1	10	15.294	-0.0380
25.1	15	6.819	-0.0757	40.1	15	18.400	-0.0457
25.1	15	6.783	-0.0768	40.1	15	18.543	-0.0465
25.1	15	6.614	-0.0743	40.1	15	18.065	-0.0463
25.1	20	9.263	-0.0831	40.1	15	17.369	-0.0475
25.1	20	9.509	-0.0834	40.1	15	17.963	-0.0479
25.1	20	9.353	-0.0828	40.1	15	17.668	-0.0470
25.1	20	9.665	-0.0829	40.1	20	22.047	-0.0530
25.1	20	9.392	-0.0824	40.1	20	22.620	-0.0526
25.1	20	9.464	-0.0827	40.1	20	22.118	-0.0551
25.1	20	9.475	-0.0831	40.1	20	21.946	-0.0543
25.1	20	9.358	-0.0836	40.1	20	21.167	-0.0539
25.1	30	13.190	-0.0859	40.1	20	20.778	-0.0552
25.1	30	12.963	-0.0850	40.1	20	21.050	-0.0532
25.1	30	13.167	-0.0870	40.1	20	20.683	-0.0550
25.1	30	13.342	-0.0872	40.1	20	21.667	-0.0539
25.1	30	13.101	-0.0875	40.1	30	28.566	-0.0631
25.1	30	13.328	-0.0871	40.1	30	29.870	-0.0645
25.1	30	13.326	-0.0868	40.1	30	28.743	-0.0626
25.1	30	13.126	-0.0873	40.1	30	28.415	-0.0636
25.1	30	12.933	-0.0867	40.1	30	29.268	-0.0629
25.1	40	17.876	-0.0836	40.1	30	30.515	-0.0612
25.1	40	17.738	-0.0901	40.1	30	29.973	-0.0636
25.1	40	17.795	-0.0887	40.1	30	28.593	-0.0627
25.1	40	17.719	-0.0903	40.1	40	35.283	-0.0661
25.1	40	17.676	-0.0911	40.1	40	36.164	-0.0683
25.1	40	17.697	-0.0900	40.1	40	34.831	-0.0685
25.1	60	24.852	-0.0908	40.1	40	35.548	-0.0675
25.1	60	25.174	-0.0903	40.1	40	34.455	-0.0681
25.1	60	25.567	-0.0905	40.1	40	35.774	-0.0666
25.1	60	24.516	-0.0903	40.1	40	36.482	-0.0669
25.1	60	24.837	-0.0900	40.1	60	54.127	-0.0704
25.1	60	24.773	-0.0912	40.1	60	46.807	-0.0732
25.1	60	25.045	-0.0911	40.1	60	49.172	-0.0743
25.1	60	25.389	-0.0909	40.1	60	48.984	-0.0742
25.1	60	25.073	-0.0904	40.1	60	48.811	-0.0728
25.1	60	25.335	-0.0898	40.1	60	50.865	-0.0735
25.1	60	24.811	-0.0910	40.1	60	52.380	-0.0723
25.1	60	24.926	-0.0912	40.1	60	49.149	-0.0741
25.1	80	32.219	-0.0878	40.1	60	49.530	-0.0739
25.1	80	30.900	-0.0916	40.1	80	56.831	-0.0741

40.1	80	56.872	-0.0748	50.2	20	46.318	-0.0355
40.1	80	58.162	-0.0746	50.2	20	43.441	-0.0354
40.1	80	59.494	-0.0739	50.2	20	43.957	-0.0351
40.1	80	58.320	-0.0736	50.2	20	43.983	-0.0357
40.1	80	60.014	-0.0743	50.2	30	54.853	-0.0448
40.1	80	57.829	-0.0735	50.2	30	53.350	-0.0449
40.1	80	60.258	-0.0748	50.2	30	50.129	-0.0449
40.1	80	57.115	-0.0727	50.2	30	56.981	-0.0433
40.1	80	59.871	-0.0755	50.2	30	50.978	-0.0442
40.1	80	63.709	-0.0757	50.2	30	53.624	-0.0450
40.1	80	62.560	-0.0764	50.2	30	52.617	-0.0445
40.1	80	60.168	-0.0739	50.2	30	55.441	-0.0435
50.2	5	19.999	-0.0123	50.2	40	60.687	-0.0505
50.2	5	22.182	-0.0115	50.2	40	63.501	-0.0501
50.2	5	24.278	-0.0100	50.2	40	65.044	-0.0487
50.2	5	28.513	-0.0146	50.2	40	65.373	-0.0496
50.2	5	30.370	-0.0130	50.2	40	63.770	-0.0511
50.2	5	29.870	-0.0119	50.2	40	65.274	-0.0506
50.2	5	27.614	-0.0121	50.2	40	67.306	-0.0496
50.2	5	26.942	-0.0120	50.2	60	81.337	-0.0571
50.2	5	23.498	-0.0126	50.2	60	86.358	-0.0585
50.2	5	24.405	-0.0118	50.2	60	80.000	-0.0583
50.2	10	34.331	-0.0243	50.2	60	85.556	-0.0577
50.2	10	34.448	-0.0221	50.2	60	86.507	-0.0577
50.2	10	32.067	-0.0220	50.2	60	84.291	-0.0569
50.2	10	33.713	-0.0212	50.2	60	84.912	-0.0570
50.2	10	32.174	-0.0223	50.2	60	82.917	-0.0580
50.2	10	36.373	-0.0220	50.2	60	88.251	-0.0564
50.2	10	32.224	-0.0215	50.2	80	100.527	-0.0655
50.2	15	34.382	-0.0308	50.2	80	97.439	-0.0630
50.2	15	36.843	-0.0297	50.2	80	103.126	-0.0619
50.2	15	40.413	-0.0287	50.2	80	101.171	-0.0617
50.2	15	39.440	-0.0282	50.2	80	101.036	-0.0618
50.2	15	38.488	-0.0276	50.2	80	104.126	-0.0615
50.2	15	36.814	-0.0282	50.2	80	106.603	-0.0618
50.2	15	35.900	-0.0290	50.2	80	103.249	-0.0613
50.2	20	41.447	-0.0372	50.2	80	108.003	-0.0619
50.2	20	42.625	-0.0362				
50.2	20	42.496	-0.0351				

Supporting Table S8. Rate constants for the forward and backward reaction step with the associated standard deviation for the reaction of $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(pyridine)]CF_3SO_3$ (**3**) with PMe_3 in acetone. Metal attack.

T [°C]	k_1 [l mol^{-1} s^{-1}]	σ [l mol^{-1} s^{-1}]	k_{-1} [s^{-1}]	σ [s^{-1}]
10.5	226.5	1.9	0.0013	0.0214
25.1	422.1	2.4	1.1050	0.0597
40.1	695.5	20.9	8.2180	0.5142
50.2	1048.0	39.7	22.9800	1.2660

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Supporting Table S9. Kinetic data for the concentration and temperature dependence of the reaction of [Ru(η^5-C_5H_5)(η^4-C_5H_4O)(pyridine)]CF_3SO_3 (**3**) with P(n-butyl)$_3$ in acetone. Metal attack.

T [°C]	PBu_3 [M]	k_{obs} [s^{-1}]	A
-50.0	0.010	0.035	0.126
-50.0	0.010	0.032	0.128
-50.0	0.010	0.032	0.128
-50.0	0.040	0.131	0.133
-50.0	0.040	0.130	0.135
-50.0	0.040	0.128	0.137
-40.0	0.010	0.062	0.123
-40.0	0.010	0.062	0.123
-40.0	0.010	0.062	0.125
-40.0	0.020	0.127	0.123
-40.0	0.020	0.121	0.130
-40.0	0.020	0.121	0.132
-40.0	0.040	0.243	0.136
-40.0	0.040	0.239	0.134
-40.0	0.040	0.245	0.135
-30.0	0.010	0.111	0.117
-30.0	0.010	0.114	0.118
-30.0	0.010	0.111	0.118
-30.0	0.020	0.219	0.125
-30.0	0.020	0.227	0.127
-30.0	0.020	0.228	0.126
-20.0	0.010	0.181	0.103
-20.0	0.010	0.182	0.103
-20.0	0.010	0.193	0.104
-20.0	0.020	0.409	0.121
-20.0	0.020	0.390	0.124
-20.0	0.020	0.373	0.122
-20.0	0.040	0.782	0.122
-20.0	0.040	0.745	0.126
-20.0	0.040	0.748	0.126
-10.0	0.010	0.357	0.084
-10.0	0.010	0.353	0.083
-10.0	0.010	0.398	0.083
-10.0	0.020	0.638	0.105
-10.0	0.020	0.670	0.107
-10.0	0.020	0.698	0.111
-10.0	0.040	1.320	0.117
-10.0	0.040	1.270	0.120
-10.0	0.040	1.270	0.125
10.7	0.101	13.521	0.720
10.7	0.101	13.637	0.718
10.7	0.101	12.902	0.712
10.7	0.101	13.013	0.727
10.7	0.101	13.429	0.735
10.7	0.101	12.955	0.720
10.7	0.101	13.196	0.728
10.7	0.101	12.644	0.734
10.7	0.151	18.150	0.729
10.7	0.151	18.388	0.721
10.7	0.151	18.293	0.730
10.7	0.151	18.117	0.731
10.7	0.151	18.248	0.724
10.7	0.151	17.978	0.733
10.7	0.151	18.176	0.690
10.7	0.202	23.165	0.733
10.7	0.202	22.157	0.737
10.7	0.202	23.010	0.730
10.7	0.202	22.599	0.731
10.7	0.202	23.106	0.728
10.7	0.202	23.195	0.727
10.7	0.202	22.692	0.724
10.7	0.202	22.737	0.732
10.7	0.202	22.876	0.721
10.7	0.202	22.483	0.744
10.7	0.252	27.131	0.730
10.7	0.252	27.386	0.736
10.7	0.252	27.221	0.737
10.7	0.252	27.691	0.738
10.7	0.252	27.484	0.742
10.7	0.252	27.100	0.733
10.7	0.252	27.709	0.732
10.7	0.252	27.592	0.737
10.7	0.303	30.751	0.736
10.7	0.303	30.738	0.740
10.7	0.303	30.902	0.738
10.7	0.303	30.845	0.737
10.7	0.303	30.280	0.733
21.4	0.101	23.740	0.594
21.4	0.101	24.529	0.589
21.4	0.101	24.094	0.589
21.4	0.101	24.300	0.591
21.4	0.101	23.685	0.586
21.4	0.101	24.535	0.590
21.4	0.101	24.304	0.589
21.4	0.101	23.538	0.583
21.4	0.101	24.270	0.587
21.4	0.101	23.919	0.582
21.4	0.151	31.314	0.657
21.4	0.151	29.880	0.654
21.4	0.151	31.829	0.649
21.4	0.151	31.156	0.646
21.4	0.151	31.003	0.652
21.4	0.151	29.902	0.661
21.4	0.151	28.474	0.663
21.4	0.151	30.403	0.652
21.4	0.202	35.484	0.721
21.4	0.202	34.628	0.678
21.4	0.202	34.489	0.696
21.4	0.202	36.740	0.716
21.4	0.202	35.443	0.716
21.4	0.202	35.648	0.690

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21.4	0.202	34.817	0.722	32.6	0.151	63.623	0.442
21.4	0.202	35.006	0.704	32.6	0.151	61.502	0.448
21.4	0.202	35.012	0.663	32.6	0.151	59.293	0.437
21.4	0.252	41.249	0.767	32.6	0.151	57.656	0.414
21.4	0.252	42.724	0.783	32.6	0.151	56.076	0.445
21.4	0.252	37.933	0.761	32.6	0.202	60.917	0.552
21.4	0.252	36.966	0.751	32.6	0.202	60.739	0.508
21.4	0.252	37.471	0.803	32.6	0.202	63.680	0.506
21.4	0.252	37.121	0.769	32.6	0.202	53.770	0.488
21.4	0.252	36.616	0.741	32.6	0.202	64.925	0.498
21.4	0.252	39.845	0.722	32.6	0.202	53.429	0.506
21.4	0.303	47.641	0.766	32.6	0.202	60.442	0.491
21.4	0.303	49.625	0.767	32.6	0.202	71.965	0.474
21.4	0.303	46.767	0.773	32.6	0.252	74.223	0.520
21.4	0.303	47.760	0.745	32.6	0.252	65.251	0.507
21.4	0.303	52.429	0.829	32.6	0.252	55.868	0.536
21.4	0.303	48.759	0.746	32.6	0.252	60.718	0.488
21.4	0.303	45.955	0.747	32.6	0.252	61.352	0.497
21.4	0.303	43.813	0.734	32.6	0.252	56.094	0.499
32.6	0.111	52.187	0.405	32.6	0.252	68.342	0.502
32.6	0.111	51.824	0.410	32.6	0.303	67.424	0.597
32.6	0.111	50.696	0.410	32.6	0.303	72.676	0.592
32.6	0.111	51.462	0.405	32.6	0.303	82.557	0.591
32.6	0.111	49.685	0.392	32.6	0.303	56.641	0.556
32.6	0.111	48.469	0.378	32.6	0.303	63.942	0.572
32.6	0.111	50.335	0.388	32.6	0.303	68.488	0.503
32.6	0.111	50.463	0.378	32.6	0.303	58.148	0.552
32.6	0.151	63.522	0.484	32.6	0.303	91.923	0.422
32.6	0.151	62.046	0.472				
32.6	0.151	61.913	0.458				
32.6	0.151	61.786	0.466				

Supporting Table S10. Rate constants for the forward and backward reaction step with the associated standard deviation for the reaction of $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(pyridine)]CF_3SO_3$ (**3**) with PBu_3 in acetone. Metal attack.

T [°C]	k_{1m} [l mol^{-1} s^{-1}]	σ_{1m} [l mol^{-1} s^{-1}]	k_{2m} [s^{-1}]	σ_{2m} [s^{-1}]
-50.0	3.22	7.28E-02	7.78E-04	2.14E-03
-40.0	6.02	9.82E-02	1.59E-03	1.04E-03
-30.0	11.27	5.23E-01		
-20.0	19.24	6.95E-01		
-10.0	30.60	1.27E+00	6.12E-02	3.21E-02
10.7	86.35	1.53E+00	5.08E+00	3.07E-01
21.4	110.60	6.25E+00	1.30E+01	8.60E-01
32.6	130.10	3.61E+01	3.69E+01	4.60E+00

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Supporting Table S11. Kinetic data for the concentration and temperature dependence of the reaction of [Ru(η^5-C_5H_5) (η^4-C_5H_4O)(pyridine)]CF_3SO_3 (**3**) with PMe_2Ph in acetone. Metal attack.

T [°C]	PMe_2Ph [M]	k_{obs} [s^{-1}]	A
-20.0	0.010	1.41	6.77E-02
-20.0	0.010	1.42	6.75E-02
-20.0	0.020	2.13	8.36E-02
-20.0	0.020	2.22	8.43E-02
-20.0	0.020	2.26	8.63E-02
-20.0	0.020	2.25	8.63E-02
-20.0	0.005	1.05	4.01E-02
-20.0	0.005	1.06	3.97E-02
-20.0	0.040	4.00	8.12E-02
-20.0	0.040	4.00	8.26E-02
-20.0	0.040	3.93	8.29E-02
-15.0	0.010	2.22	5.28E-02
-15.0	0.010	2.24	5.32E-02
-15.0	0.010	2.25	5.34E-02
-15.0	0.020	3.50	7.09E-02
-15.0	0.020	3.45	7.23E-02
-15.0	0.020	3.32	7.23E-02
-15.0	0.005	1.70	2.96E-02
-15.0	0.005	1.71	2.94E-02
-15.0	0.005	1.71	3.02E-02
-15.0	0.040	5.47	7.46E-02
-15.0	0.040	5.38	7.34E-02
-15.0	0.040	5.55	7.43E-02
-10.0	0.010	3.21	3.97E-02
-10.0	0.010	3.56	4.02E-02
-10.0	0.010	3.55	4.10E-02
-10.0	0.020	4.93	5.88E-02
-10.0	0.020	4.82	5.77E-02
-10.0	0.005	2.74	2.16E-02
-10.0	0.005	2.34	2.10E-02
-10.0	0.005	2.84	2.13E-02
-10.0	0.040	7.44	6.35E-02
-10.0	0.040	7.65	6.44E-02
-5.0	0.010	5.92	2.78E-02
-5.0	0.010	5.34	2.72E-02
-5.0	0.010	4.64	2.70E-02
-5.0	0.020	7.42	4.47E-02
-5.0	0.020	7.38	4.44E-02
-5.0	0.005	4.11	1.38E-02
-5.0	0.005	4.35	1.42E-02
-5.0	0.005	4.84	1.44E-02
0.0	0.010	19.70	1.96E-02
0.0	0.010	20.90	1.47E-02
0.0	0.010	16.00	1.61E-02
0.0	0.020	21.10	2.57E-02
0.0	0.020	20.90	2.58E-02
0.0	0.040	34.10	4.38E-02
0.0	0.040	33.80	4.44E-02
0.0	0.040	32.80	4.04E-02
10.3	0.021	55.23	2.49E-01
10.3	0.021	51.75	2.54E-01
10.3	0.021	51.39	2.58E-01
10.3	0.021	51.44	2.56E-01
10.3	0.021	50.83	2.58E-01
10.3	0.021	50.50	2.58E-01
10.3	0.021	51.69	2.59E-01
10.3	0.021	50.45	2.57E-01
10.3	0.021	51.49	2.60E-01
10.3	0.021	49.86	2.58E-01
10.3	0.041	60.53	3.88E-01
10.3	0.041	59.44	3.91E-01
10.3	0.041	58.22	3.85E-01
10.3	0.041	59.37	3.89E-01
10.3	0.041	58.54	3.85E-01
10.3	0.041	59.45	3.88E-01
10.3	0.062	68.48	4.96E-01
10.3	0.062	70.40	5.00E-01
10.3	0.062	67.48	4.95E-01
10.3	0.062	68.76	4.94E-01
10.3	0.062	67.97	4.98E-01
10.3	0.062	69.46	4.96E-01
10.3	0.062	68.31	4.97E-01
10.3	0.062	67.76	4.93E-01
10.3	0.062	67.54	4.94E-01
10.3	0.062	64.69	4.62E-01
10.3	0.082	76.51	5.76E-01
10.3	0.082	77.03	5.71E-01
10.3	0.082	77.11	5.76E-01
10.3	0.082	76.55	5.72E-01
10.3	0.082	76.64	5.71E-01
10.3	0.082	77.78	5.74E-01
10.3	0.082	74.79	5.66E-01
10.3	0.082	77.30	5.74E-01
10.3	0.082	75.70	5.65E-01
10.3	0.103	86.91	6.50E-01
10.3	0.103	86.92	6.43E-01
10.3	0.103	86.50	6.43E-01
10.3	0.103	84.84	6.38E-01
10.3	0.103	87.03	6.45E-01
10.3	0.103	86.71	6.44E-01
10.3	0.256	129.11	7.75E-01
10.3	0.256	156.08	9.55E-01
10.3	0.256	151.89	8.95E-01
10.3	0.256	154.35	8.41E-01
10.3	0.256	145.75	8.62E-01
10.3	0.256	144.99	8.29E-01
10.3	0.256	139.65	8.22E-01
21.2	0.062	151.48	2.23E-01
21.2	0.062	156.97	2.31E-01
21.2	0.062	158.52	2.35E-01
21.2	0.062	151.13	2.23E-01

21.2	0.062	146.11	2.08E-01	21.2	0.103	184.41	3.71E-01
21.2	0.062	150.79	2.18E-01	21.2	0.103	178.51	3.58E-01
21.2	0.062	150.36	2.11E-01	21.2	0.103	183.36	3.66E-01
21.2	0.062	143.18	2.03E-01	21.2	0.103	185.63	3.52E-01
21.2	0.062	154.23	2.14E-01	21.2	0.103	173.99	3.27E-01
21.2	0.062	159.08	2.11E-01	21.2	0.103	177.25	3.23E-01
21.2	0.062	152.16	2.16E-01	21.2	0.103	172.03	3.13E-01
21.2	0.082	172.41	3.13E-01	21.2	0.103	169.03	2.83E-01
21.2	0.082	183.34	3.34E-01	21.2	0.103	165.15	2.85E-01
21.2	0.082	164.61	3.02E-01	21.2	0.103	164.33	2.70E-01
21.2	0.082	168.41	3.09E-01	21.2	0.256	183.95	3.40E-01
21.2	0.082	159.86	2.90E-01	21.2	0.256	178.15	3.33E-01
21.2	0.082	177.34	3.07E-01	21.2	0.256	176.21	3.08E-01
21.2	0.082	176.66	3.04E-01	21.2	0.256	193.27	3.44E-01
21.2	0.082	160.78	2.85E-01	21.2	0.256	179.69	3.14E-01
21.2	0.082	174.38	2.94E-01	21.2	0.256	188.61	3.41E-01
21.2	0.082	156.49	2.80E-01	21.2	0.256	191.52	3.32E-01
21.2	0.082	176.45	2.94E-01	21.2	0.256	185.38	3.06E-01
21.2	0.103	178.12	3.61E-01				

Supporting Table S12. Rate constants for the forward and backward reaction step with the associated standard deviation for the reaction of $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(pyridine)]CF_3SO_3$ (**3**) with PMe_2Ph in acetone. Metal attack.

T [°C]	k_{1m} [l mol^{-1} s^{-1}]	σ_{1m} [l mol^{-1} s^{-1}]	k_{2m} [s^{-1}]	σ_{2m} [s^{-1}]
-20.0	80.76	2.076	0.6309	0.009732
-15.0	107.6	3.78	1.168	0.01223
-5.0	137.2	13.16	2.101	0.1565
0.0	620.2	68.78	8.614	7.284
10.3	427.9	14.75	41.9	1.11
21.2	593.5	212.2	116.3	16.5

Supporting Table S13. Kinetic data for the concentration and temperature dependence of the reaction of $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(pyridine)]CF_3SO_3$ (**3**) with TTP in acetone. CPD attack, all temperatures fitted simultaneous with Scientist.

T [°C]	TTP [M]	k_{obs} [s^{-1}]	A
1.6	0.005	0.043	0.393
1.6	0.005	0.046	0.392
1.6	0.005	0.044	0.358
3.6	0.020	0.186	0.472
3.6	0.020	0.185	0.461
3.6	0.020	0.187	0.473
10.0	0.005	0.110	0.339
10.0	0.010	0.174	0.441
10.0	0.010	0.168	0.389
10.0	0.015	0.218	0.491
10.0	0.015	0.211	0.489
10.0	0.015	0.230	0.471
10.0	0.020	0.311	0.462
10.0	0.020	0.304	0.472
10.0	0.020	0.307	0.471
20.0	0.005	0.186	0.406
20.0	0.005	0.178	0.419
20.0	0.005	0.181	0.414
20.0	0.010	0.393	0.176
20.0	0.010	0.364	0.276
20.0	0.015	0.446	0.473
20.0	0.015	0.494	0.454
20.0	0.020	0.617	0.464
20.0	0.020	0.616	0.460
30.0	0.005	0.404	0.343
30.0	0.005	0.403	0.352
30.0	0.005	0.396	0.370
30.0	0.010	0.622	0.404
30.0	0.010	0.639	0.401
30.0	0.015	0.907	0.437
30.0	0.015	0.938	0.435

30.0	0.020	1.250	0.408	40.0	0.020	2.360	0.385
30.0	0.020	1.240	0.434	50.0	0.010	2.440	0.334
40.0	0.005	0.791	0.266	50.0	0.010	2.470	0.339
40.0	0.005	0.724	0.235	50.0	0.010	2.620	0.310
40.0	0.010	1.220	0.377	50.0	0.015	3.480	0.363
40.0	0.010	1.310	0.275	50.0	0.015	3.530	0.340
40.0	0.010	1.370	0.322	50.0	0.015	3.650	0.353
40.0	0.010	1.330	0.367	50.0	0.020	4.330	0.370
40.0	0.015	1.870	0.395	50.0	0.020	4.360	0.351
40.0	0.015	1.810	0.398	50.0	0.020	4.300	0.350
40.0	0.020	2.350	0.400				
40.0	0.020	2.380	0.396				

Supporting Table S14. Kinetic data for the concentration and temperature dependence of the reaction of [Ru(η^5-C_5H_5)(η^4-C_5H_4O)(pyridine)]CF_3SO_3 (**3**) with PMe_2Ph in acetone. The λ values represent the observed pseudo-first order rate constants and the A values are their amplitudes. The calculated values are based on the parameters in Table 1 and 2, and the rate law described in the text. CPD attack.

T [°C]	PMe_2Ph [M]	λ_1 [s^{-1}]	λ_2 [s^{-1}]	A_1/A_2 obs	λ_1 (calc) [s^{-1}]	A_1/A_2 [s^{-1}]	A_1/A_2 calc
30.9	0.0398	1.21E-02	6.20E-04	-0.820	1.14E-02	6.24E-04	-0.835
30.9	0.0398	1.33E-02	5.64E-04	-0.797	1.14E-02	6.24E-04	-0.835
30.9	0.1058	2.97E-02	5.56E-04	-0.789	3.03E-02	6.24E-04	-0.829
30.9	0.1058	2.96E-02	5.73E-04	-0.798	3.03E-02	6.24E-04	-0.829
30.9	0.1320	4.03E-02	7.76E-04	-0.845	3.78E-02	6.24E-04	-0.828
30.9	0.1320	3.26E-02	8.51E-04	-0.991	3.78E-02	6.24E-04	-0.828
40.4	0.0131	8.89E-03	2.46E-03	-0.822	7.88E-03	2.28E-03	-0.907
40.4	0.0398	2.56E-02	3.27E-03	-0.884	2.39E-02	2.28E-03	-0.882
40.4	0.0398	3.01E-02	3.18E-03	-1.049	2.39E-02	2.28E-03	-0.882
40.4	0.0795	5.00E-02	2.62E-03	-0.932	4.78E-02	2.28E-03	-0.876
40.4	0.0795	4.72E-02	2.24E-03	-0.873	4.78E-02	2.28E-03	-0.876
40.4	0.1058	5.78E-02	1.70E-03	-0.777	6.37E-02	2.28E-03	-0.874
40.4	0.1058	6.61E-02	2.69E-03	-0.962	6.37E-02	2.28E-03	-0.874
40.4	0.1320	7.08E-02	2.09E-03	-0.843	7.94E-02	2.28E-03	-0.873
40.4	0.1320	7.05E-02	2.01E-03	-0.873	7.94E-02	2.28E-03	-0.873
50.7	0.0131	1.37E-02	5.22E-03	-0.846	1.67E-02	6.91E-03	-0.937
50.7	0.0131	1.39E-02	5.99E-03	-0.931	1.67E-02	6.91E-03	-0.937
50.7	0.0131	1.27E-02	4.95E-03	-0.887	1.67E-02	6.91E-03	-0.937
50.7	0.0131	1.29E-02	5.48E-03	-0.920	1.67E-02	6.91E-03	-0.937
50.7	0.0398	4.84E-02	7.20E-03	-0.814	5.07E-02	6.91E-03	-0.907
50.7	0.0398	5.33E-02	9.01E-03	-0.946	5.07E-02	6.91E-03	-0.907
50.7	0.0398	4.80E-02	6.11E-03	-0.882	5.07E-02	6.91E-03	-0.907
50.7	0.0398	4.56E-02	5.36E-03	-0.838	5.07E-02	6.91E-03	-0.907
50.7	0.0398	5.89E-02	7.71E-03	-0.897	5.07E-02	6.91E-03	-0.907
50.7	0.0398	6.36E-02	6.52E-03	-0.956	5.07E-02	6.91E-03	-0.907
50.7	0.1058	1.41E-01	8.18E-03	-0.833	1.35E-01	6.91E-03	-0.898
50.7	0.1058	1.58E-01	8.81E-03	-0.909	1.35E-01	6.91E-03	-0.898
50.7	0.1058	1.66E-01	9.79E-03	-0.985	1.35E-01	6.91E-03	-0.898
50.7	0.1058	1.33E-01	7.29E-03	-0.839	1.35E-01	6.91E-03	-0.898
50.7	0.1320	1.84E-01	8.50E-03	-0.858	1.68E-01	6.91E-03	-0.897
50.7	0.1320	2.14E-01	1.00E-02	-0.994	1.68E-01	6.91E-03	-0.897
50.7	0.1320	2.22E-01	1.08E-02	-1.036	1.68E-01	6.91E-03	-0.897
50.7	0.1320	2.25E-01	1.07E-02	-1.046	1.68E-01	6.91E-03	-0.897
50.7	0.1320	2.23E-01	1.06E-02	-1.033	1.68E-01	6.91E-03	-0.897

50.7	0.1320	1.84E-01	8.57E-03	-0.852	1.68E-01	6.91E-03	-0.897
55.0	0.0131	2.63E-02	1.18E-02	-0.874	2.42E-02	1.13E-02	-0.902
55.0	0.0131	2.64E-02	1.26E-02	-0.892	2.42E-02	1.13E-02	-0.902
55.0	0.0131	2.60E-02	1.35E-02	-0.922	2.42E-02	1.13E-02	-0.902
55.0	0.0131	2.64E-02	1.41E-02	-0.942	2.42E-02	1.13E-02	-0.902
55.0	0.0398	7.40E-02	1.40E-02	-0.826	7.36E-02	1.13E-02	-0.845
55.0	0.0398	8.14E-02	1.40E-02	-0.840	7.36E-02	1.13E-02	-0.845
55.0	0.0398	8.36E-02	1.35E-02	-0.854	7.36E-02	1.13E-02	-0.845
55.0	0.0398	8.05E-02	1.23E-02	-0.854	7.36E-02	1.13E-02	-0.845
55.0	0.0398	8.23E-02	1.28E-02	-0.857	7.36E-02	1.13E-02	-0.845
55.0	0.0795	1.35E-01	9.81E-03	-0.807	1.47E-01	1.13E-02	-0.831
55.0	0.0795	1.40E-01	9.94E-03	-0.814	1.47E-01	1.13E-02	-0.831
55.0	0.0795	1.58E-01	1.15E-02	-0.878	1.47E-01	1.13E-02	-0.831
55.0	0.0795	1.57E-01	1.08E-02	-0.865	1.47E-01	1.13E-02	-0.831
55.0	0.0795	1.56E-01	1.06E-02	-0.889	1.47E-01	1.13E-02	-0.831
55.0	0.1058	1.83E-01	1.19E-02	-0.800	1.96E-01	1.13E-02	-0.827
55.0	0.1058	2.06E-01	1.29E-02	-0.828	1.96E-01	1.13E-02	-0.827
55.0	0.1058	2.03E-01	1.33E-02	-0.808	1.96E-01	1.13E-02	-0.827
55.0	0.1058	1.99E-01	1.36E-02	-0.803	1.96E-01	1.13E-02	-0.827
55.0	0.1058	2.09E-01	1.40E-02	-0.833	1.96E-01	1.13E-02	-0.827
55.0	0.1320	1.99E-01	9.40E-03	-0.798	2.44E-01	1.13E-02	-0.825
55.0	0.1320	2.37E-01	1.07E-02	-0.868	2.44E-01	1.13E-02	-0.825
55.0	0.1320	2.06E-01	8.91E-03	-0.791	2.44E-01	1.13E-02	-0.825
55.0	0.1320	2.18E-01	9.03E-03	-0.834	2.44E-01	1.13E-02	-0.825
55.0	0.1320	2.19E-01	9.60E-03	-0.821	2.44E-01	1.13E-02	-0.825

Supporting Table S15. Temperature dependence of the rate constants for the k1 and k3 reaction step with the associated standard deviation as obtained by stopped-flow photometry for the reaction of $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(pyridine)]CF_3SO_3$ (**3**) with PMe_2Ph in acetone. CPD attack.

T [°C]	k_{1c} [l mol^{-1} s^{-1}]	σ_{1c} [l mol^{-1} s^{-1}]	k_{3c} [s^{-1}]	σ_{3c} [s^{-1}]
30.9	0.287	1.46E-02	6.24E-04	3.20E-05
40.4	0.602	2.99E-02	2.28E-03	1.15E-04
50.7	1.274	5.44E-02	6.91E-03	3.00E-04
55.0	1.848	4.09E-02	1.13E-02	2.52E-04

Supporting Table S16. Kinetic data for the temperature dependence of the reaction of $[Ru(\eta^5\text{-}C_5H_5)(\eta^3\text{-}C_5H_4O(PMe_2Ph))(pyridine)]CF_3SO_3$ (**10c**) in acetone-d_6 as followed by ^{1}H-NMR. 1,2-product formation.

T [°C]	k_{3c} [s^{-1}]	σ (k_{3c}) [s^{-1}]
37.8	5.40E-03	2.88E-04
26.2	1.11E-03	4.87E-05
14.5	1.91E-04	5.73E-06
3.0	3.42E-05	6.84E-07

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Supporting Table S17. Kinetic data for the concentration and temperature dependence of the reaction of [Ru(η^5-C_5H_5) (η^4-C_5H_4O)(pyridine)]CF_3SO_3 (**4**) with $PMePh_2$ in acetone. CPD attack with NMR

TC [°C]	k_{1c} [l mol^{-1} s^{-1}]	σk_{1c} [l mol^{-1} s^{-1}]	k_{2c} [s^{-1}]	σk_{2c} [s^{-1}]	k_{3c} [s^{-1}]	σk_{3c} [s^{-1}]
0.8	0.0108	2.72E-04	7.42E-04	2.37E-05	2.14E-05	3.78E-07
17.1	0.0323	1.04E-03	4.60E-03	1.70E-04	4.31E-04	3.90E-06
25.3	0.0540	2.07E-03	1.27E-02	5.81E-04	1.02E-03	1.07E-05
30.7	0.0662	3.37E-03	1.89E-02	1.14E-03	2.13E-03	2.22E-05
35.8	0.2130	2.84E-01	8.06E-02	8.10E-02	3.00E-03	1.17E-04

Supporting Table S18. Kinetic data for the concentration and temperature dependence of the reaction of [Ru(η^5-C_5H_5) (η^4-C_5H_4O)(thiourea)]CF_3SO_3 (**4**) with PMe_3 in acetone. Metal attack.

T [°C]	PMe_3 [mM]	k_{obs} [s^{-1}]	A
11,1	19,4	0,951	-0,0456
11,1	19,4	0,779	-0,0447
11,1	19,4	0,710	-0,0404
11,1	19,4	0,797	-0,0418
11,1	19,4	0,750	-0,0417
11,1	19,4	0,742	-0,0402
11,1	58,2	1,555	-0,0771
11,1	58,2	1,510	-0,0758
11,1	58,2	1,554	-0,0759
11,1	58,2	1,490	-0,0762
11,1	58,2	1,501	-0,0739
11,1	58,2	1,410	-0,0740
11,1	97,0	2,215	-0,0883
11,1	97,0	2,090	-0,0840
11,1	97,0	2,140	-0,0835
11,1	97,0	2,182	-0,0843
11,1	97,0	2,190	-0,0849
11,1	97,0	2,152	-0,0843
11,1	145,5	3,136	-0,0917
11,1	145,5	3,250	-0,0970
11,1	145,5	3,191	-0,1060
11,1	145,5	2,987	-0,0880
11,1	145,5	3,200	-0,0997
11,1	145,5	3,114	-0,0927
11,1	145,5	3,067	-0,0917
11,1	194,0	3,149	-0,0677
11,1	194,0	3,438	-0,0792
11,1	194,0	3,393	-0,0798
11,1	194,0	3,561	-0,0778
11,1	194,0	3,437	-0,0811
11,1	194,0	3,628	-0,0811
14,6	19,4	0,866	-0,0328
14,6	19,4	0,885	-0,0318
14,6	19,4	0,914	-0,0328
14,6	19,4	0,930	-0,0330
14,6	19,4	0,879	-0,0331
14,6	19,4	0,722	-0,0363
14,6	19,4	1,068	-0,0330
14,6	19,4	0,918	-0,0334
14,6	58,2	1,622	-0,0666
14,6	58,2	1,650	-0,0669
14,6	58,2	1,618	-0,0672
14,6	58,2	1,616	-0,0669
14,6	58,2	1,674	-0,0679
14,6	58,2	1,685	-0,0669
14,6	58,2	1,706	-0,0668
14,6	58,2	1,782	-0,0670
14,6	97,0	2,280	-0,0748
14,6	97,0	2,498	-0,0743
14,6	97,0	2,581	-0,0766
14,6	97,0	2,581	-0,0778
14,6	97,0	2,469	-0,0779
14,6	97,0	2,450	-0,0780
14,6	97,0	2,539	-0,0793
14,6	97,0	2,445	-0,0725
14,6	145,5	3,410	-0,0840
14,6	145,5	3,503	-0,0866
14,6	145,5	3,491	-0,0881
14,6	145,5	3,552	-0,0866
14,6	145,5	3,317	-0,0867
14,6	145,5	3,488	-0,0866
14,6	145,5	3,465	-0,0878
14,6	145,5	3,461	-0,0900
14,6	145,5	3,213	-0,0868
14,6	194,0	4,265	-0,0824
14,6	194,0	4,218	-0,0877
14,6	194,0	4,190	-0,0843
14,6	194,0	4,096	-0,0857
14,6	194,0	4,001	-0,0873
14,6	194,0	4,019	-0,0871
14,6	194,0	3,830	-0,0879
14,6	194,0	4,369	-0,0839
20,1	58,2	3,064	-0,0561
20,1	58,2	3,121	-0,0597
20,1	58,2	3,111	-0,0596

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20,1	58,2	3,125	-0,0609
20,1	58,2	3,001	-0,0627
20,1	58,2	2,933	-0,0628
20,1	58,2	2,821	-0,0627
20,1	58,2	2,704	-0,0627
20,1	97,0	3,789	-0,0694
20,1	97,0	3,575	-0,0649
20,1	97,0	3,618	-0,0669
20,1	97,0	3,787	-0,0673
20,1	97,0	3,691	-0,0682
20,1	97,0	3,537	-0,0662
20,1	97,0	3,843	-0,0654
20,1	97,0	4,131	-0,0629
20,1	145,5	4,727	-0,0760
20,1	145,5	5,179	-0,0779
20,1	145,5	5,184	-0,0826
20,1	145,5	5,233	-0,0760
20,1	145,5	4,564	-0,0688
20,1	145,5	4,471	-0,0717
20,1	194,0	5,665	-0,0577
20,1	194,0	4,955	-0,0590
20,1	194,0	5,335	-0,0563
20,1	194,0	5,380	-0,0571
20,1	194,0	4,970	-0,0613
20,1	194,0	5,428	-0,0572
20,1	194,0	5,906	-0,0579
25,3	58,2	4,140	-0,0359
25,3	58,2	3,649	-0,0366
25,3	58,2	4,230	-0,0371
25,3	58,2	3,669	-0,0348
25,3	58,2	3,981	-0,0377
25,3	58,2	3,783	-0,0368
25,3	58,2	3,603	-0,0375
25,3	58,2	3,659	-0,0351
25,3	58,2	3,984	-0,0376
25,3	97,0	5,674	-0,0481
25,3	97,0	5,390	-0,0495
25,3	97,0	5,472	-0,0490
25,3	97,0	5,340	-0,0510
25,3	97,0	4,730	-0,0470
25,3	97,0	5,468	-0,0507
25,3	97,0	5,840	-0,0503
25,3	97,0	5,536	-0,0482
25,3	145,5	6,449	-0,0558
25,3	145,5	6,203	-0,0547
25,3	145,5	6,271	-0,0543
25,3	145,5	6,112	-0,0555
25,3	145,5	6,661	-0,0551
25,3	145,5	6,350	-0,0544
25,3	145,5	6,387	-0,0542
25,3	145,5	6,321	-0,0551
25,3	145,5	6,280	-0,0538
25,3	194,0	7,596	-0,0599
25,3	194,0	8,061	-0,0601
25,3	194,0	8,476	-0,0632
25,3	194,0	8,204	-0,0623
25,3	194,0	7,913	-0,0619
25,3	194,0	8,848	-0,0654
25,3	194,0	7,768	-0,0612
25,3	194,0	7,873	-0,0640
25,3	194,0	8,584	-0,0640
30,6	58,2	5,888	-0,0275
30,6	58,2	7,280	-0,0258
30,6	58,2	8,459	-0,0280
30,6	58,2	6,917	-0,0254
30,6	58,2	7,484	-0,0259
30,6	97,0	8,487	-0,0351
30,6	97,0	8,857	-0,0347
30,6	97,0	8,545	-0,0365
30,6	97,0	9,130	-0,0371
30,6	97,0	8,098	-0,0358
30,6	97,0	7,649	-0,0363
30,6	97,0	8,898	-0,0368
30,6	97,0	7,714	-0,0357
30,6	145,5	12,070	-0,0479
30,6	145,5	9,950	-0,0471
30,6	145,5	11,516	-0,0486
30,6	145,5	9,669	-0,0445
30,6	145,5	11,201	-0,0478
30,6	145,5	12,014	-0,0480
30,6	145,5	11,230	-0,0478
30,6	145,5	11,066	-0,0476
30,6	145,5	10,401	-0,0471
30,6	145,5	10,582	-0,0461
30,6	194,0	13,429	-0,0532
30,6	194,0	13,869	-0,0557
30,6	194,0	14,200	-0,0543
30,6	194,0	13,727	-0,0542
30,6	194,0	14,306	-0,0549
30,6	194,0	13,904	-0,0548

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Supporting Table S19. Rate constants for the forward and backward reaction step with the associated standard deviation for the reaction of $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(\text{thiourea})]CF_3SO_3$ (**4**) with PMe_3 in acetone. Metal attack.

T [°C]	k_{1m} [l mol^{-1} s^{-1}]	σ_{1m} [l mol^{-1} s^{-1}]	k_{2m} [s^{-1}]	σ_{2m} [s^{-1}]
11.1	17.50	0.431	0.391	0.025
14.6	19.67	0.420	0.598	0.037
20.1	25.77	1.230	1.364	0.140
25.3	31.13	2.252	2.192	0.284
30.6	53.53	5.227	3.469	0.870

Supporting Table S20. Kinetic data for the concentration and temperature dependence of the reaction of $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(\text{thiourea})]CF_3SO_3$ (**4**) with TTP in acetone. CPD attack.

T [°C]	TTP [M]	k_{obs} [s^{-1}]	A
17.0	5.00E-03	0.0287	0.072
17.0	5.00E-03	0.0287	0.074
17.0	5.00E-03	0.0294	0.071
17.0	5.00E-03	0.0251	0.075
17.0	5.00E-03	0.0304	0.074
17.0	5.00E-03	0.0280	0.079
17.0	5.00E-03	0.0333	0.068
17.0	1.25E-02	0.0433	0.114
17.0	1.25E-02	0.0428	0.115
17.0	1.25E-02	0.0421	0.115
17.0	1.25E-02	0.0443	0.112
17.0	1.25E-02	0.0425	0.115
17.0	1.25E-02	0.0423	0.115
17.0	1.25E-02	0.0417	0.115
17.0	2.50E-02	0.0546	0.145
17.0	2.50E-02	0.0548	0.146
17.0	2.50E-02	0.0565	0.146
17.0	2.50E-02	0.0539	0.147
17.0	2.50E-02	0.0546	0.145
17.0	2.50E-02	0.0538	0.146
17.0	2.50E-02	0.0540	0.144
17.0	2.50E-02	0.0543	0.146
17.0	3.75E-02	0.0698	0.161
17.0	3.75E-02	0.0716	0.161
17.0	3.75E-02	0.0696	0.160
17.0	3.75E-02	0.0697	0.161
17.0	3.75E-02	0.0684	0.163
17.0	3.75E-02	0.0693	0.161
17.0	3.75E-02	0.0687	0.164
17.0	3.75E-02	0.0679	0.163
17.0	3.75E-02	0.0768	0.169
17.0	5.00E-02	0.0782	0.170
17.0	5.00E-02	0.0776	0.169
17.0	5.00E-02	0.0770	0.171
17.0	5.00E-02	0.0757	0.170
17.0	5.00E-02	0.0778	0.171
17.0	5.00E-02	0.0782	0.171
17.0	5.00E-02	0.0779	0.172
20.8	5.00E-03	0.0415	0.070
20.8	5.00E-03	0.0425	0.074
20.8	5.00E-03	0.0413	0.077
20.8	5.00E-03	0.0414	0.079
20.8	5.00E-03	0.0414	0.084
20.8	5.00E-03	0.0418	0.083
20.8	1.25E-02	0.0599	0.118
20.8	1.25E-02	0.0612	0.122
20.8	1.25E-02	0.0605	0.123
20.8	2.50E-02	0.0816	0.139
20.8	2.50E-02	0.0836	0.139
20.8	2.50E-02	0.0825	0.142
20.8	2.50E-02	0.0831	0.143
20.8	2.50E-02	0.0830	0.144
20.8	2.50E-02	0.0828	0.144
20.8	2.50E-02	0.0825	0.145
20.8	3.75E-02	0.1052	0.160
20.8	3.75E-02	0.1020	0.160
20.8	3.75E-02	0.1033	0.160
20.8	3.75E-02	0.1018	0.161
20.8	3.75E-02	0.1035	0.161
20.8	3.75E-02	0.1031	0.162
20.8	3.75E-02	0.1036	0.161
20.8	3.75E-02	0.1030	0.161
20.8	5.00E-02	0.1172	0.168
20.8	5.00E-02	0.1162	0.166
20.8	5.00E-02	0.1189	0.166
20.8	5.00E-02	0.1175	0.168
20.8	5.00E-02	0.1172	0.168
20.8	5.00E-02	0.1175	0.167
20.8	5.00E-02	0.1180	0.168
20.8	5.00E-02	0.1180	0.168
27.8	5.62E-03	0.0750	0.068
27.8	5.62E-03	0.0689	0.068
27.8	5.62E-03	0.0731	0.065
27.8	5.62E-03	0.0724	0.069
27.8	5.62E-03	0.0717	0.068
27.8	5.62E-03	0.0673	0.070
27.8	5.62E-03	0.0731	0.068

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27.8	5.62E-03	0.0718	0.068	38.8	2.54E-02	0.2571	0.069
27.8	5.62E-03	0.0732	0.067	38.8	2.54E-02	0.2509	0.068
27.8	1.27E-02	0.0880	0.079	38.8	3.77E-02	0.3147	0.072
27.8	1.27E-02	0.0880	0.080	38.8	3.77E-02	0.3245	0.074
27.8	1.27E-02	0.0895	0.080	38.8	3.77E-02	0.3235	0.076
27.8	1.27E-02	0.0863	0.081	38.8	3.77E-02	0.3178	0.075
27.8	1.27E-02	0.0862	0.082	38.8	3.77E-02	0.3235	0.078
27.8	1.27E-02	0.0859	0.080	38.8	3.77E-02	0.3198	0.075
27.8	1.27E-02	0.0852	0.080	38.8	3.77E-02	0.3186	0.077
27.8	2.54E-02	0.1154	0.118	38.8	3.77E-02	0.3158	0.076
27.8	2.54E-02	0.1187	0.120	38.8	4.99E-02	0.3673	0.078
27.8	2.54E-02	0.1173	0.120	38.8	4.99E-02	0.3553	0.075
27.8	2.54E-02	0.1186	0.117	38.8	4.99E-02	0.3749	0.075
27.8	2.54E-02	0.1165	0.119	38.8	4.99E-02	0.3722	0.075
27.8	2.54E-02	0.1213	0.117	38.8	4.99E-02	0.3728	0.074
27.8	2.54E-02	0.1200	0.117	38.8	4.99E-02	0.3634	0.071
27.8	3.77E-02	0.1410	0.136	38.8	4.99E-02	0.3745	0.074
27.8	3.77E-02	0.1479	0.134	38.8	4.99E-02	0.3579	0.072
27.8	3.77E-02	0.1509	0.136	44.9	1.25E-02	0.0650	0.018
27.8	3.77E-02	0.1506	0.137	44.9	1.25E-02	0.0899	0.011
27.8	3.77E-02	0.1518	0.136	44.9	1.25E-02	0.1296	0.010
27.8	3.77E-02	0.1496	0.136	44.9	1.25E-02	0.1138	0.010
27.8	3.77E-02	0.1475	0.136	44.9	1.25E-02	0.1340	0.012
27.8	3.77E-02	0.1493	0.135	44.9	1.25E-02	0.1070	0.012
27.8	4.99E-02	0.1754	0.145	44.9	1.25E-02	0.1301	0.012
27.8	4.99E-02	0.1763	0.147	44.9	2.50E-02	0.2392	0.027
27.8	4.99E-02	0.1783	0.145	44.9	2.50E-02	0.2881	0.027
27.8	4.99E-02	0.1767	0.145	44.9	2.50E-02	0.2804	0.025
27.8	4.99E-02	0.1758	0.144	44.9	2.50E-02	0.3272	0.028
27.8	4.99E-02	0.1770	0.146	44.9	2.50E-02	0.2951	0.026
27.8	4.99E-02	0.1769	0.145	44.9	2.50E-02	0.2820	0.026
38.8	5.62E-03	0.1393	0.036	44.9	2.50E-02	0.3544	0.029
38.8	5.62E-03	0.1304	0.036	44.9	3.75E-02	0.2818	0.031
38.8	5.62E-03	0.1442	0.035	44.9	3.75E-02	0.2523	0.028
38.8	5.62E-03	0.1530	0.035	44.9	3.75E-02	0.2563	0.033
38.8	5.62E-03	0.1487	0.035	44.9	3.75E-02	0.2566	0.027
38.8	5.62E-03	0.1536	0.036	44.9	3.75E-02	0.2902	0.028
38.8	5.62E-03	0.1461	0.034	44.9	3.75E-02	0.2752	0.027
38.8	1.27E-02	0.2173	0.043	44.9	3.75E-02	0.3046	0.028
38.8	1.27E-02	0.2226	0.046	44.9	3.75E-02	0.2863	0.026
38.8	1.27E-02	0.2366	0.056	44.9	3.75E-02	0.3362	0.028
38.8	1.27E-02	0.2324	0.056	44.9	5.00E-02	0.4644	0.044
38.8	1.27E-02	0.2269	0.046	44.9	5.00E-02	0.4392	0.038
38.8	1.27E-02	0.2367	0.057	44.9	5.00E-02	0.4650	0.040
38.8	1.27E-02	0.2234	0.047	44.9	5.00E-02	0.5107	0.044
38.8	2.54E-02	0.2364	0.080	44.9	5.00E-02	0.4537	0.040
38.8	2.54E-02	0.2502	0.069	44.9	5.00E-02	0.5031	0.041
38.8	2.54E-02	0.2503	0.069	44.9	5.00E-02	0.4752	0.043
38.8	2.54E-02	0.2494	0.068	44.9	5.00E-02	0.4734	0.043
38.8	2.54E-02	0.2529	0.069				

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Supporting Table S21.: Rate constants for the forward and backward reaction step with the associated standard deviation for the reaction of $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(\text{thiourea})]CF_3SO_3$ (**4**) with TTP in acetone. CPD attack.

T [°C]	k_{1c} [l mol^{-1} s^{-1}]	σ_{1c} [l mol^{-1} s^{-1}]	k_{2c} [s^{-1}]	σ_{2c} [s^{-1}]
17.0	0.954	0.030	0.0303	9.95E-04
20.8	1.733	0.018	0.0355	4.37E-04
27.8	2.393	0.040	0.0573	1.54E-03
38.8	4.672	0.197	0.1411	6.60E-03
44.9	9.013	0.897		

Supporting Table S22. Kinetic data for the concentration and temperature dependence of the reaction of $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(\text{thiourea})]CF_3SO_3$ (**4**) with PMe_2Ph in acetone. CPD attack.

T [°C]	PMe_2Ph [M]	k_{obs} [s^{-1}]	A
15.9	0.021	2.97E-03	0.520
15.9	0.021	2.99E-03	0.520
15.9	0.021	2.95E-03	0.524
15.9	0.041	5.46E-03	0.523
15.9	0.041	5.46E-03	0.525
15.9	0.041	5.48E-03	0.523
15.9	0.062	7.83E-03	0.524
15.9	0.062	7.65E-03	0.523
15.9	0.062	7.88E-03	0.518
15.9	0.082	9.73E-03	0.522
15.9	0.082	9.65E-03	0.516
15.9	0.082	9.86E-03	0.529
15.9	0.124	1.37E-02	0.510
15.9	0.124	1.33E-02	0.512
15.9	0.124	1.37E-02	0.504
15.9	0.140	1.49E-02	0.494
15.9	0.140	1.50E-02	0.504
15.9	0.140	1.52E-02	0.508
25.0	0.021	6.57E-03	0.521
25.0	0.021	6.55E-03	0.519
25.0	0.021	6.51E-03	0.527
25.0	0.021	6.54E-03	0.521
25.0	0.041	1.19E-02	0.527
25.0	0.041	1.19E-02	0.523
25.0	0.041	1.19E-02	0.529
25.0	0.041	1.18E-02	0.522
25.0	0.041	1.19E-02	0.523
25.0	0.062	1.66E-02	0.519
25.0	0.062	1.65E-02	0.519
25.0	0.062	1.66E-02	0.518
25.0	0.062	1.65E-02	0.520
25.0	0.082	2.16E-02	0.517
25.0	0.082	2.11E-02	0.518
25.0	0.082	2.15E-02	0.519
25.0	0.082	2.15E-02	0.516
25.0	0.082	2.14E-02	0.518
25.0	0.124	3.00E-02	0.519
25.0	0.124	3.06E-02	0.516
25.0	0.124	3.03E-02	0.515
25.0	0.140	3.53E-02	0.524
25.0	0.140	3.47E-02	0.527
25.0	0.140	3.49E-02	0.523
25.0	0.140	3.45E-02	0.518
25.0	0.140	3.49E-02	0.522
32.9	0.021	1.25E-02	0.512
32.9	0.021	1.24E-02	0.509
32.9	0.021	1.23E-02	0.510
32.9	0.021	1.23E-02	0.511
32.9	0.021	1.23E-02	0.513
32.9	0.021	1.23E-02	0.510
32.9	0.041	2.24E-02	0.512
32.9	0.041	2.21E-02	0.515
32.9	0.041	2.20E-02	0.516
32.9	0.041	2.21E-02	0.513
32.9	0.041	2.20E-02	0.516
32.9	0.062	3.20E-02	0.511
32.9	0.062	3.12E-02	0.518
32.9	0.062	3.12E-02	0.520
32.9	0.062	3.18E-02	0.515
32.9	0.062	3.17E-02	0.516
32.9	0.082	4.13E-02	0.512
32.9	0.082	4.10E-02	0.512
32.9	0.082	4.11E-02	0.513
32.9	0.082	4.08E-02	0.515
32.9	0.082	4.06E-02	0.518
32.9	0.124	5.74E-02	0.510
32.9	0.124	5.75E-02	0.514
32.9	0.124	5.73E-02	0.512
32.9	0.124	5.67E-02	0.516
32.9	0.124	5.69E-02	0.512
32.9	0.140	6.39E-02	0.514
32.9	0.140	6.37E-02	0.520
32.9	0.140	6.46E-02	0.512
32.9	0.140	6.51E-02	0.514
32.9	0.140	6.52E-02	0.516
41.1	0.008	1.07E-02	0.464
41.1	0.008	1.08E-02	0.463

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41.1	0.008	1.06E-02	0.467	44.5	0.144	1.67E-01	0.511
41.1	0.008	1.06E-02	0.469	44.5	0.144	1.68E-01	0.507
41.1	0.008	1.06E-02	0.464	44.5	0.144	1.68E-01	0.507
41.1	0.008	1.04E-02	0.469	44.5	0.144	1.68E-01	0.513
41.1	0.021	2.25E-02	0.497	44.5	0.144	1.69E-01	0.506
41.1	0.021	2.21E-02	0.502	44.5	0.144	1.68E-01	0.509
41.1	0.021	2.24E-02	0.501	51.0	0.008	2.38E-02	0.409
41.1	0.021	2.24E-02	0.501	51.0	0.008	2.31E-02	0.416
41.1	0.021	2.26E-02	0.495	51.0	0.008	2.32E-02	0.417
41.1	0.021	2.23E-02	0.500	51.0	0.008	2.31E-02	0.420
41.1	0.041	4.17E-02	0.512	51.0	0.008	2.34E-02	0.416
41.1	0.041	4.11E-02	0.510	51.0	0.008	2.43E-02	0.399
41.1	0.041	4.09E-02	0.514	51.0	0.021	4.87E-02	0.457
41.1	0.041	4.04E-02	0.518	51.0	0.021	4.75E-02	0.467
41.1	0.041	4.07E-02	0.516	51.0	0.021	4.79E-02	0.466
41.1	0.041	4.07E-02	0.512	51.0	0.021	4.84E-02	0.465
41.1	0.062	5.81E-02	0.515	51.0	0.041	8.45E-02	0.492
41.1	0.062	5.76E-02	0.521	51.0	0.041	8.12E-02	0.493
41.1	0.062	5.81E-02	0.515	51.0	0.041	7.78E-02	0.510
41.1	0.062	5.83E-02	0.515	51.0	0.041	8.29E-02	0.488
41.1	0.062	5.86E-02	0.513	51.0	0.041	8.14E-02	0.495
41.1	0.082	7.65E-02	0.518	51.0	0.062	1.18E-01	0.490
41.1	0.082	7.66E-02	0.517	51.0	0.062	1.18E-01	0.495
41.1	0.082	7.47E-02	0.519	51.0	0.062	1.18E-01	0.498
41.1	0.082	7.60E-02	0.520	51.0	0.062	1.18E-01	0.502
41.1	0.082	7.61E-02	0.519	51.0	0.062	1.21E-01	0.500
41.1	0.124	9.92E-02	0.499	51.0	0.082	1.46E-01	0.498
41.1	0.124	9.95E-02	0.536	51.0	0.082	1.46E-01	0.500
41.1	0.124	1.03E-01	0.521	51.0	0.082	1.50E-01	0.501
41.1	0.124	1.03E-01	0.518	51.0	0.082	1.52E-01	0.503
44.5	0.021	3.20E-02	0.483	51.0	0.082	1.51E-01	0.513
44.5	0.021	3.18E-02	0.485	51.0	0.124	1.99E-01	0.491
44.5	0.021	3.25E-02	0.492	51.0	0.124	1.96E-01	0.517
44.5	0.021	3.28E-02	0.489	51.0	0.124	2.05E-01	0.504
44.5	0.021	3.30E-02	0.482	51.0	0.124	2.10E-01	0.497
44.5	0.041	5.13E-02	0.483	51.0	0.124	2.07E-01	0.502
44.5	0.041	5.16E-02	0.482	51.0	0.144	2.42E-01	0.508
44.5	0.041	5.12E-02	0.486	51.0	0.144	2.43E-01	0.497
44.5	0.041	5.11E-02	0.490	51.0	0.144	2.45E-01	0.494
44.5	0.062	7.73E-02	0.503	51.0	0.144	2.48E-01	0.507
44.5	0.062	7.70E-02	0.500	51.0	0.144	2.55E-01	0.504
44.5	0.062	7.74E-02	0.499	51.0	0.280	4.35E-01	0.517
44.5	0.062	7.72E-02	0.499	51.0	0.280	4.33E-01	0.502
44.5	0.062	7.67E-02	0.508	51.0	0.280	4.37E-01	0.519
44.5	0.062	7.73E-02	0.502	51.0	0.280	4.44E-01	0.523
44.5	0.082	9.80E-02	0.502	51.0	0.280	4.44E-01	0.523
44.5	0.082	9.63E-02	0.502				
44.5	0.082	9.66E-02	0.506				
44.5	0.082	9.81E-02	0.507				
44.5	0.082	9.88E-02	0.499				
44.5	0.124	1.47E-01	0.509				
44.5	0.124	1.47E-01	0.508				
44.5	0.124	1.47E-01	0.506				
44.5	0.124	1.47E-01	0.511				
44.5	0.124	1.48E-01	0.509				

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Supporting Table S23. Rate constants for the forward and backward reaction step with the associated standard deviation for the reaction of $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(\text{thiourea})]CF_3SO_3$ (**4**) with PMe_2Ph in acetone. CPD attack.

T [°C]	k_{1c} [l mol^{-1} s^{-1}]	σ_{1c} [l mol^{-1} s^{-1}]	k_{2c} [s^{-1}]	σ_{2c} [s^{-1}]
15.9	0.111	7.85E-04	8.37E-04	3.08E-05
25.0	0.242	1.13E-03	1.62E-03	4.08E-05
32.9	0.445	2.51E-03	3.33E-03	1.12E-04
41.1	0.883	5.59E-03	3.68E-03	1.46E-04
44.5	1.136	4.47E-03	5.78E-03	3.05E-04
51.0	1.637	1.24E-02	1.25E-02	4.28E-04

Supporting Table S24. Kinetic data for the concentration and temperature dependence of the reaction of $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(\text{thiourea})]CF_3SO_3$ (**4**) with $PMePh_2$ in acetone. CPD attack.

T [°C]	$PMePh_2$ [M]	k_{obs} [s^{-1}]	A
20.5	0.052	7.71E-03	0.106
20.5	0.052	7.89E-03	0.103
20.5	0.052	7.79E-03	0.104
20.5	0.052	7.68E-03	0.105
20.5	0.052	7.98E-03	0.106
20.5	0.106	8.99E-03	0.176
20.5	0.106	8.85E-03	0.176
20.5	0.106	8.65E-03	0.179
20.5	0.106	8.91E-03	0.174
20.5	0.106	9.11E-03	0.180
20.5	0.160	1.03E-02	0.231
20.5	0.160	9.36E-03	0.229
20.5	0.160	9.70E-03	0.238
20.5	0.160	9.04E-03	0.236
20.5	0.213	1.12E-02	0.275
20.5	0.213	1.10E-02	0.272
20.5	0.213	1.05E-02	0.283
20.5	0.213	1.05E-02	0.282
20.5	0.213	1.07E-02	0.275
20.5	0.213	1.08E-02	0.275
20.5	0.266	1.26E-02	0.310
20.5	0.266	1.21E-02	0.306
20.5	0.266	1.22E-02	0.322
20.5	0.266	1.20E-02	0.313
20.5	0.266	1.23E-02	0.316
20.5	0.319	1.38E-02	0.359
20.5	0.319	1.42E-02	0.325
20.5	0.319	1.32E-02	0.329
20.5	0.319	1.35E-02	0.341
20.5	0.319	1.25E-02	0.334
24.9	0.052	1.38E-02	0.085
24.9	0.052	1.44E-02	0.085
24.9	0.052	1.42E-02	0.081
24.9	0.052	1.54E-02	0.077
24.9	0.052	1.46E-02	0.079
24.9	0.106	1.58E-02	0.143
24.9	0.106	1.55E-02	0.145
24.9	0.106	1.57E-02	0.145
24.9	0.106	1.55E-02	0.146
24.9	0.106	1.58E-02	0.144
24.9	0.106	1.50E-02	0.147
24.9	0.160	1.67E-02	0.193
24.9	0.160	1.77E-02	0.185
24.9	0.160	1.78E-02	0.183
24.9	0.160	1.76E-02	0.183
24.9	0.160	1.77E-02	0.180
24.9	0.213	1.86E-02	0.239
24.9	0.213	1.87E-02	0.237
24.9	0.213	1.86E-02	0.239
24.9	0.213	1.88E-02	0.238
24.9	0.266	1.96E-02	0.264
24.9	0.266	1.94E-02	0.265
24.9	0.266	1.99E-02	0.262
24.9	0.266	1.95E-02	0.261
24.9	0.266	1.96E-02	0.262
24.9	0.266	1.95E-02	0.261
24.9	0.319	2.13E-02	0.304
24.9	0.319	2.13E-02	0.302
24.9	0.319	2.13E-02	0.303
24.9	0.319	2.14E-02	0.302
24.9	0.319	2.14E-02	0.300
31.5	0.052	2.93E-02	0.063
31.5	0.052	2.92E-02	0.065
31.5	0.052	2.99E-02	0.064
31.5	0.052	2.88E-02	0.063
31.5	0.052	2.98E-02	0.064
31.5	0.106	3.07E-02	0.122
31.5	0.106	2.82E-02	0.123
31.5	0.106	2.98E-02	0.124
31.5	0.106	2.94E-02	0.120
31.5	0.106	3.00E-02	0.119
31.5	0.160	3.45E-02	0.163
31.5	0.160	3.12E-02	0.164
31.5	0.160	3.14E-02	0.163
31.5	0.160	3.34E-02	0.163
31.5	0.160	3.01E-02	0.157
31.5	0.160	3.11E-02	0.164

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31.5	0.160	2.83E-02	0.169
31.5	0.160	2.96E-02	0.169
31.5	0.160	2.84E-02	0.170
31.5	0.266	4.07E-02	0.227
31.5	0.266	3.88E-02	0.228
31.5	0.266	4.10E-02	0.221
31.5	0.266	3.58E-02	0.215
31.5	0.266	3.95E-02	0.231
31.5	0.266	4.00E-02	0.221
31.5	0.266	4.09E-02	0.225
31.5	0.266	3.99E-02	0.223
31.5	0.319	4.17E-02	0.221
31.5	0.319	4.23E-02	0.204
31.5	0.319	4.25E-02	0.209
31.5	0.319	4.27E-02	0.212
36.8	0.052	5.48E-02	0.055
36.8	0.052	5.50E-02	0.054
36.8	0.052	5.90E-02	0.055
36.8	0.052	5.80E-02	0.054
36.8	0.052	5.66E-02	0.053
36.8	0.106	6.02E-02	0.096
36.8	0.106	5.91E-02	0.096
36.8	0.106	5.86E-02	0.097
36.8	0.106	5.93E-02	0.097
36.8	0.106	6.03E-02	0.097
36.8	0.106	5.95E-02	0.095
36.8	0.160	6.50E-02	0.131
36.8	0.160	6.39E-02	0.129
36.8	0.160	6.42E-02	0.130
36.8	0.160	6.39E-02	0.132
36.8	0.160	6.41E-02	0.132
36.8	0.213	7.03E-02	0.164
36.8	0.213	6.98E-02	0.165
36.8	0.213	6.96E-02	0.165
36.8	0.213	6.88E-02	0.166
36.8	0.213	6.92E-02	0.165
36.8	0.213	6.98E-02	0.164
36.8	0.266	7.38E-02	0.190
36.8	0.266	7.52E-02	0.186
36.8	0.266	7.35E-02	0.187
36.8	0.266	7.58E-02	0.189
36.8	0.266	7.45E-02	0.185
36.8	0.319	7.90E-02	0.218
36.8	0.319	7.73E-02	0.218
36.8	0.319	7.83E-02	0.218
36.8	0.319	7.84E-02	0.214
43.7	0.052	1.32E-01	0.043
43.7	0.052	1.36E-01	0.043
43.7	0.052	1.29E-01	0.043
43.7	0.052	1.37E-01	0.043
43.7	0.052	1.25E-01	0.043
43.7	0.052	1.36E-01	0.043
43.7	0.052	1.32E-01	0.043
43.7	0.052	1.39E-01	0.106
43.7	0.106	1.31E-01	0.078
43.7	0.106	1.28E-01	0.078
43.7	0.106	1.29E-01	0.077
43.7	0.106	1.32E-01	0.077
43.7	0.106	1.30E-01	0.078
43.7	0.160	1.31E-01	0.044
43.7	0.160	1.38E-01	0.043
43.7	0.160	1.31E-01	0.043
43.7	0.160	1.40E-01	0.106
43.7	0.160	1.41E-01	0.107
43.7	0.160	1.38E-01	0.105
43.7	0.160	1.39E-01	0.103
43.7	0.160	1.41E-01	0.103
43.7	0.213	1.43E-01	0.134
43.7	0.213	1.44E-01	0.135
43.7	0.213	1.46E-01	0.134
43.7	0.213	1.45E-01	0.132
43.7	0.213	1.44E-01	0.134
43.7	0.266	1.56E-01	0.153
43.7	0.266	1.57E-01	0.154
43.7	0.266	1.57E-01	0.153
43.7	0.266	1.58E-01	0.153
43.7	0.266	1.55E-01	0.154
43.7	0.319	1.60E-01	0.180
43.7	0.319	1.61E-01	0.181
43.7	0.319	1.63E-01	0.178
43.7	0.319	1.60E-01	0.179
43.7	0.319	1.60E-01	0.182
51.0	0.052	1.83E-01	0.051
51.0	0.052	1.62E-01	0.048
51.0	0.052	1.68E-01	0.045
51.0	0.052	1.84E-01	0.043
51.0	0.106	2.39E-01	0.066
51.0	0.106	2.30E-01	0.065
51.0	0.106	2.35E-01	0.065
51.0	0.106	2.39E-01	0.064
51.0	0.106	2.32E-01	0.065
51.0	0.160	2.71E-01	0.101
51.0	0.160	2.27E-01	0.105
51.0	0.160	2.38E-01	0.100
51.0	0.160	2.10E-01	0.106
51.0	0.213	2.54E-01	0.119
51.0	0.213	2.70E-01	0.118
51.0	0.213	2.35E-01	0.124
51.0	0.213	2.65E-01	0.117
51.0	0.213	2.71E-01	0.121
51.0	0.266	2.28E-01	0.152
51.0	0.266	2.26E-01	0.152
51.0	0.266	2.23E-01	0.150
51.0	0.266	2.40E-01	0.146
51.0	0.319	3.07E-01	0.161
51.0	0.319	2.92E-01	0.162
51.0	0.319	2.86E-01	0.162
51.0	0.319	2.92E-01	0.159
51.0	0.319	2.57E-01	0.157
51.0	0.319	2.53E-01	0.166

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Supporting Table S25. Rate constants for the forward and backward reaction step with the associated standard deviation for the reaction of $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(\text{thiourea})]CF_3SO_3$ (**4**) with PMe_2Ph in acetone. CPD attack.

T [°C]	k_{1c} [l mol^{-1} s^{-1}]	σ_{1c} [l mol^{-1} s^{-1}]	k_{2c} [s^{-1}]	σ_{2c} [s^{-1}]
20.5	0.0202	1.04E-03	6.75E-03	1.50E-04
24.9	0.0247	1.74E-03	1.33E-02	3.80E-04
31.5	0.0495	2.28E-03	2.63E-02	5.16E-04
36.8	0.0888	3.76E-03	5.03E-02	7.69E-04
43.7	0.1456	8.43E-03	1.15E-01	1.95E-03
51.0			2.14E-01	7.21E-03

Supporting Table S26. Exchange rate constants and associated standard deviations for $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(\text{thiourea})]CF_3SO_3$ (**4**) with PMe_3 in nitromethane-d_6 as obtained by ^{1}H-DNMR.

T [°C]	k_{ex} [s^{-1}]	σ_{ex} [s^{-1}]
-6.1	350	25.5
-11.9	235	10.2
-17.6	141	2.55
-23.2	74	1.02
-23.6	70	1.02
-27.0	45	1.02
-29.0	43	0.51
-35.1	19	1.02
-40.9	10.5	0.77

Supporting Table S27. Rate constants for the reaction of $[Ru(\eta^3\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(\text{pyridine})\ PMe_3]CF_3SO_3$ (**4**) with PMe_3 in acetone-d_6 yielding $[Ru(\eta^5\text{-}C_5H_4O)(\text{pyridine})(PMe_3)_2]CF_3SO_3$ and $C_5H_4PMe_3$ as obtained by ^{1}H-NMR spectroscopy.

T [°C]	PMe_3 [M]	k_1 [s^{-1}]	$k_{2.0}$ [M^{-1}s^{-1}]	
-15.2	0.485	2.77E-04	5.70E-04	
-10.3	0.483	4.21E-04	8.72E-04	
-5.0	0.480	7.85E-04	1.64E-03	
0.0	0.477	1.29E-03	2.70E-03	
0.0	0.912	2.89E-03	3.16E-03	
0.0	1.307	3.05E-03	2.33E-03	
0.0	1.672	4.70E-03	2.81E-03	
0.0			2.61E-03	Regression at 0°C

Supporting Table S28. Rate constants for the reaction $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(CH_3CN)]CF_3SO_3$ (**2**) with pyridine-d_5 in acetone-d_6 yielding $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(\text{pyridine-}d_5)]CF_3SO_3$ (**3**) as obtained by ^{1}H-NMR spectroscopy.

T [°C]	k_1 [M^{-1}s^{-1}]	σ_1 [M^{-1}s^{-1}]
3.0	1.51E-04	7.55E-06
20.0	7.71E-04	3.86E-05
25.0	1.47E-03	7.35E-05
30.0	2.19E-03	1.10E-04
35.0	5.26E-03	2.63E-04
40.0	7.95E-03	3.98E-04
45.0	1.35E-02	6.75E-04
50.0	1.83E-02	9.15E-04

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X-ray Structure Determination

Supporting Table S29. Atomic coordinates and equivalent isotropic displacement parameters ($Å^2 \times 10^3$) for [Ru(η^5-C_5H_5)(η^4-C_5H_4O)(py)]CF_3SO_3 (**3**). U_{eq} is defined as one third of the trace of the orthogonalized U_{ij} tensor.

	x	y	z	$U_{eq}(U_{iso})$
Ru	0.42267(3)	0.19573(2)	0.22824(2)	37(1)
C(1)	0.6579(7)	0.1238(4)	0.3373(9)	137(4)
C(2)	0.7068(5)	0.2111(8)	0.2463(5)	109(2)
C(3)	0.6760(5)	0.3274(5)	0.2839(6)	81(2)
C(4)	0.6194(6)	0.3188(6)	0.3844(6)	85(2)
C(5)	0.6081(6)	0.2054(8)	0.4226(5)	97(2)
O(1)	-0.0258(3)	0.1994(3)	0.0391(3)	66(1)
C(6)	0.1004(4)	0.1431(3)	0.0841(3)	48(1)
C(7)	0.1514(5)	0.0890(3)	0.2108(4)	50(1)
C(8)	0.2716(5)	0.0044(3)	0.2071(4)	53(1)
C(9)	0.3317(5)	0.0246(3)	0.0977(4)	55(1)
C(10)	0.2488(5)	0.1215(4)	0.0323(3)	53(1)
N	0.2989(3)	0.3648(2)	0.2006(2)	40(1)
C(11)	0.3013(5)	0.4367(3)	0.1016(3)	52(1)
C(12)	0.2245(6)	0.5483(4)	0.0864(4)	69(1)
C(13)	0.1415(6)	0.5863(4)	0.1735(5)	73(1)
C(14)	0.1386(6)	0.5126(4)	0.2750(5)	69(1)
C(15)	0.2193(5)	0.4040(4)	0.2864(4)	54(1)
S	0.33540(12)	0.28774(8)	0.70417(8)	49(1)
O(2)	0.2919(4)	0.3663(3)	0.7971(3)	75(1)
O(3)	0.4102(4)	0.3590(3)	0.6179(3)	78(1)
O(4)	0.4155(5)	0.1813(3)	0.7549(4)	106(1)
C(16)	0.1216(5)	0.2142(4)	0.6026(4)	61(1)
F(1)	0.1356(5)	0.1295(3)	0.5144(3)	101(1)
F(2)	0.0216(5)	0.1555(4)	0.6670(3)	137(2)
F(3)	0.0333(4)	0.3023(3)	0.5381(3)	102(1)

Supporting Table S30. Hydrogen coordinates and isotropic displacement parameters ($Å^2 \times 10^3$) for [Ru(η^5-C_5H_5)(η^4-C_5H_4O)(py)]CF_3SO_3 (**3**). Except for H(7) and H(10) (unrestricted refinement in x,y,z) the hydrogen atoms were inserted in idealized positions and were refined riding with the atoms to which they were bonded using *SHELXL*93 defaults. The isotropic U-values were fixed at 1.2 x U_{eq} of their carrier atoms.

	x	y	z	U_{iso}
H(1)	0.6593(7)	0.0352(4)	0.3386(9)	164
H(2)	0.7497(5)	0.1908(8)	0.1777(5)	131
H(3)	0.6931(5)	0.4029(5)	0.2434(6)	97
H(4)	0.5899(6)	0.3886(6)	0.4249(6)	102
H(5)	0.5731(6)	0.1806(8)	0.4943(5)	117
H(7)	0.1014(54)	0.0965(39)	0.2696(39)	60
H(8)	0.3065(5)	-0.0554(3)	0.2670(4)	64
H(9)	0.4131(5)	-0.0195(3)	0.0732(4)	66
H(10)	0.2573(55)	0.1529(40)	-0.0334(41)	64
H(11)	0.3560(5)	0.4110(3)	0.0413(3)	63
H(12)	0.2291(6)	0.5973(4)	0.0172(4)	83
H(13)	0.0882(6)	0.6606(4)	0.1639(5)	88
H(14)	0.0826(6)	0.5359(4)	0.3354(5)	83
H(15)	0.2189(5)	0.3554(4)	0.3565(4)	65

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Supporting Table S31. Anisotropic displacement parameters ($Å^2 \times 10^3$) for $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(py)]CF_3SO_3$ (**3**).The anisotropic displacement factor exponent takes the form: $-2\pi^2 [h^2 a^{*2} U_{11} + ... + 2 h k a^* b^* U_{12}]$

	U_{11}	U_{22}	U_{33}	U_{23}	U_{13}	U_{12}
Ru	33(1)	38(1)	40(1)	4(1)	9(1)	4(1)
C(1)	59(3)	34(2)	248(9)	4(4)	-74(4)	14(2)
C(2)	32(2)	199(7)	92(4)	-48(4)	10(2)	29(3)
C(3)	41(2)	70(3)	113(4)	21(3)	-3(2)	-8(2)
C(4)	48(2)	101(4)	85(3)	-26(3)	-13(2)	14(2)
C(5)	52(3)	149(6)	70(3)	45(4)	-13(2)	-4(3)
O(1)	43(1)	61(2)	77(2)	7(1)	-8(1)	6(1)
C(6)	40(2)	44(2)	50(2)	-2(1)	2(1)	-4(1)
C(7)	41(2)	52(2)	56(2)	6(2)	18(2)	-2(2)
C(8)	49(2)	38(2)	65(2)	8(2)	7(2)	-1(1)
C(9)	52(2)	46(2)	65(2)	-11(2)	17(2)	4(2)
C(10)	60(2)	55(2)	38(2)	-3(2)	11(2)	-3(2)
N	37(1)	40(1)	40(1)	2(1)	5(1)	5(1)
C(11)	51(2)	51(2)	50(2)	9(2)	7(2)	2(2)
C(12)	67(3)	56(2)	68(3)	20(2)	-8(2)	8(2)
C(13)	66(3)	54(2)	87(3)	-2(2)	-6(2)	22(2)
C(14)	66(3)	66(3)	77(3)	-10(2)	17(2)	24(2)
C(15)	58(2)	51(2)	54(2)	1(2)	15(2)	14(2)
S	50(1)	45(1)	49(1)	4(1)	10(1)	7(1)
O(2)	93(2)	72(2)	59(2)	-15(1)	25(2)	7(2)
O(3)	72(2)	86(2)	76(2)	2(2)	35(2)	-13(2)
O(4)	110(3)	69(2)	115(3)	7(2)	-20(2)	39(2)
C(16)	61(2)	65(2)	54(2)	2(2)	16(2)	-2(2)
F(1)	122(2)	88(2)	75(2)	-31(2)	11(2)	0(2)
F(2)	115(3)	172(4)	105(2)	0(2)	48(2)	-77(3)
F(3)	71(2)	123(3)	98(2)	9(2)	-8(2)	33(2)

Supporting Table S32.. Bond lengths [Å] and angles [°] for $[Ru(\eta^5\text{-}C_5H_5)(\eta^4\text{-}C_5H_4O)(py)]CF_3SO_3$ (**3**)

Ru-N	2.127(3)	S-O(4)	1.410(3)
Ru-C(1)	2.157(4)	S-O(3)	1.421(3)
Ru-C(9)	2.159(3)	S-O(2)	1.424(3)
Ru-C(8)	2.162(3)	S-C(16)	1.798(4)
Ru-C(2)	2.187(4)	C(16)-F(2)	1.304(5)
Ru-C(4)	2.195(4)	C(16)-F(1)	1.322(5)
Ru-C(3)	2.196(4)	C(16)-F(3)	1.332(5)
Ru-C(5)	2.202(4)		
Ru-C(10)	2.237(4)	N-Ru-C(1)	142.9(2)
Ru-C(7)	2.240(3)	N-Ru-C(9)	122.80(12)
Ru-C(6)	2.572(3)	C(1)-Ru-C(9)	93.6(2)
C(1)-C(5)	1.408(10)	N-Ru-C(8)	122.27(12)
C(1)-C(2)	1.463(10)	C(1)-Ru-C(8)	90.3(2)
C(2)-C(3)	1.346(8)	C(9)-Ru-C(8)	38.07(14)
C(3)-C(4)	1.291(8)	N-Ru-C(2)	119.1(2)
C(4)-C(5)	1.272(8)	C(1)-Ru-C(2)	39.4(3)
O(1)-C(6)	1.221(4)	C(9)-Ru-C(2)	98.4(2)
C(6)-C(10)	1.476(5)	C(8)-Ru-C(2)	117.8(2)
C(6)-C(7)	1.477(5)	N-Ru-C(4)	83.2(2)
C(7)-C(8)	1.392(5)	C(1)-Ru-C(4)	59.8(2)
C(8)-C(9)	1.410(5)	C(9)-Ru-C(4)	153.1(2)
C(9)-C(10)	1.390(5)	C(8)-Ru-C(4)	136.2(2)
C(10)-H(10)	0.81(4)	C(2)-Ru-C(4)	59.1(2)
N-C(11)	1.337(4)	N-Ru-C(3)	86.2(2)
N-C(15)	1.343(4)	C(1)-Ru-C(3)	61.5(2)
C(11)-C(12)	1.383(6)	C(9)-Ru-C(3)	131.6(2)
C(12)-C(13)	1.369(7)	C(8)-Ru-C(3)	151.3(2)
C(13)-C(14)	1.371(7)	C(2)-Ru-C(3)	35.8(2)

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N-Ru-C(5)	110.7(2)
C(1)-Ru-C(5)	37.7(3)
C(9)-Ru-C(5)	125.2(2)
C(8)-Ru-C(5)	103.3(2)
C(2)-Ru-C(5)	61.9(2)
C(4)-Ru-C(5)	33.6(2)
C(3)-Ru-C(5)	58.2(2)
N-Ru-C(10)	86.88(13)
C(1)-Ru-C(10)	127.2(2)
C(9)-Ru-C(10)	36.82(14)
C(8)-Ru-C(10)	62.16(14)
C(2)-Ru-C(10)	113.6(2)
C(4)-Ru-C(10)	161.4(2)
C(3)-Ru-C(10)	129.6(2)
C(5)-Ru-C(10)	162.0(2)
N-Ru-C(7)	86.21(12)
C(1)-Ru-C(7)	120.9(2)
C(9)-Ru-C(7)	62.25(14)
C(8)-Ru-C(7)	36.81(14)
C(2)-Ru-C(7)	154.6(3)
C(4)-Ru-C(7)	132.9(2)
C(3)-Ru-C(7)	166.0(2)
C(5)-Ru-C(7)	114.0(2)
C(10)-Ru-C(7)	61.67(14)
N-Ru-C(6)	68.81(10)
C(1)-Ru-C(6)	147.57(14)
C(9)-Ru-C(6)	57.99(13)
C(8)-Ru-C(6)	57.94(12)
C(2)-Ru-C(6)	148.4(2)
C(4)-Ru-C(6)	148.4(2)
C(3)-Ru-C(6)	148.7(2)
C(5)-Ru-C(6)	147.7(2)
C(10)-Ru-C(6)	34.86(13)
C(7)-Ru-C(6)	34.89(12)
C(5)-C(1)-C(2)	103.7(4)
C(5)-C(1)-Ru	72.9(3)
C(2)-C(1)-Ru	71.4(3)
C(3)-C(2)-C(1)	104.7(5)
C(3)-C(2)-Ru	72.5(2)
C(1)-C(2)-Ru	69.2(3)
(4)-C(3)-C(2)	110.1(5)
C(4)-C(3)-Ru	72.8(3)
C(2)-C(3)-Ru	71.8(3)
C(5)-C(4)-C(3)	113.3(6)
C(5)-C(4)-Ru	73.5(3)
C(3)-C(4)-Ru	73.0(3)
C(4)-C(5)-C(1)	108.1(6)
C(4)-C(5)-Ru	72.9(3)
C(1)-C(5)-Ru	69.5(3)
O(1)-C(6)-C(10)	129.5(3)
O(1)-C(6)-C(7)	128.3(4)
C(10)-C(6)-C(7)	102.0(3)
O(1)-C(6)-Ru	138.7(2)
C(10)-C(6)-Ru	60.0(2)
C(7)-C(6)-Ru	60.1(2)
C(8)-C(7)-C(6)	108.0(3)
C(8)-C(7)-Ru	68.6(2)
C(6)-C(7)-Ru	85.0(2)
C(7)-C(8)-C(9)	108.6(3)
C(7)-C(8)-Ru	74.6(2)
C(9)-C(8)-Ru	70.8(2)
C(10)-C(9)-C(8)	108.5(3)
C(10)-C(9)-Ru	74.6(2)
C(8)-C(9)-Ru	71.1(2)
C(9)-C(10)-C(6)	108.2(3)
C(9)-C(10)-Ru	68.6(2)
C(6)-C(10)-Ru	85.1(2)
C(11)-N-C(15)	118.0(3)
C(11)-N-Ru	122.1(2)
C(15)-N-Ru	119.8(2)
N-C(11)-C(12)	121.7(4)
C(13)-C(12)-C(11)	119.8(4)
C(12)-C(13)-C(14)	118.7(4)
C(15)-C(14)-C(13)	119.1(4)
N-C(15)-C(14)	122.8(4)
O(4)-S-O(3)	117.4(2)
O(4)-S-O(2)	113.6(2)
O(3)-S-O(2)	113.9(2)
O(4)-S-C(16)	103.3(2)
O(3)-S-C(16)	102.9(2)
O(2)-S-C(16)	103.3(2)
F(2)-C(16)-F(1)	107.9(4)
F(2)-C(16)-F(3)	107.3(4)
F(1)-C(16)-F(3)	105.7(3)
F(2)-C(16)-S	112.7(3)
F(1)-C(16)-S	112.0(3)
F(3)-C(16)-S	110.9(3)

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Supporting Table S33.. Least-squares planes data for [Ru(η^5-C_5H_5)(η^4-C_5H_4O)(py)]CF_3SO_3 (**3**). Least-squares planes (x,y,z in crystal coordinates) and deviations from them (* indicates atom used to define plane)

Plane 1 Cyclopentadienyl, C(1) through C(5)

6.318 (0.011) x + 0.416 (0.023) y + 3.564 (0.023) z = 5.422 (0.004)

*	-0.012 (0.003)	C1
*	0.009 (0.003)	C2
*	-0.003 (0.003)	C3
*	-0.006 (0.003)	C4
*	0.012 (0.003)	C5
	-1.857 (0.002)	Ru

Rms deviation of fitted atoms = 0.009

Plane 2 Cyclopentadienone, dienone part C(7) through C(10)

4.289 (0.015) x + 5.969 (0.022) y + 3.437 (0.019) z = 1.904 (0.003)

Angle to previous plane (with approximate esd) = 32.77 (0.25)

*	0.001 (0.001)	C7
*	-0.001 (0.002)	C8
*	0.001 (0.002)	C9
*	-0.001 (0.001)	C10
	1.861 (0.002)	Ru

Rms deviation of fitted atoms = 0.001

Plane 3 Cyclopentadienone, ketone part C(6), C(7), C(10) and O(1)

2.437 (0.014) x + 8.395 (0.011) y + 2.861 (0.023) z = 1.712 (0.002)

Angle to previous plane (with approximate esd) = 18.84 (0.31)

Angle to plane 1 (with approximate esd) = 51.61 (0.20)

*	-0.025 (0.003)	C6
*	0.007 (0.001)	C7
*	0.007 (0.001)	C10
*	0.011 (0.001)	O1

Rms deviation of fitted atoms = 0.015

Plane 4 Pyridine, N and C(11) through C(15)

5.375 (0.009) x + 4.216 (0.014) y + 3.189 (0.017) z = 3.788 (0.005)

Angle to plane 1 (with approximate esd) = 21.46 (0.25)

Angle to plane 2 (with approximate esd) = 11.68 (0.31)

*	-0.003 (0.002)	N
*	-0.003 (0.002)	C11
*	0.006 (0.003)	C12
*	-0.002 (0.003)	C13
*	-0.005 (0.003)	C14
*	0.008 (0.003)	C15

Rms deviation of fitted atoms = 0.005

Supporting Table S34. Atomic coordinates and equivalent isotropic displacement parameters (Å^2 x 10^3) for [Ru(η^4-C_5H_4O)(η^5-C_5H_5)($SC(NH_2)_2$]CF_3SO_3·CH_3CN (**4**·CH_3CN). U_{eq} is defined as one third of the trace of the orthogonalized U_{ij} tensor. *

	x	y	z	U_{eq}
Ru	0.50099(2)	0.18306(2)	0.18974(2)	42(1)
C(1)	0.2251(4)	0.2815(4)	0.2399(4)	91(1)
C(2)	0.3224(4)	0.3618(3)	0.1689(4)	84(1)
C(3)	0.3836(4)	0.3159(3)	0.0579(3)	83(1)
C(4)	0.3228(5)	0.2098(4)	0.0575(4)	88(1)

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C(5)	0.2238(4)	0.1895(3)	0.1681(5)	97(1)
O(1)	0.9372(2)	0.0149(2)	0.2304(2)	58(1)
C(6)	0.7815(3)	0.0619(2)	0.2688(2)	48(1)
C(7)	0.6215(3)	0.0096(2)	0.2854(2)	52(1)
C(8)	0.4847(4)	0.0814(3)	0.3603(2)	69(1)
C(9)	0.5380(4)	0.1913(3)	0.3698(2)	75(1)
C(10)	0.7079(3)	0.1873(2)	0.2996(3)	61(1)
S(1)	0.72958(8)	0.11904(5)	0.02268(5)	46(1)
C(11)	0.8588(3)	0.2260(2)	-0.0217(2)	44(1)
N(1)	0.8279(3)	0.3297(2)	0.0290(2)	60(1)
N(2)	0.9909(3)	0.2012(2)	-0.1112(2)	58(1)
S(2)	0.26766(8)	0.42242(5)	0.76643(5)	49(1)
O(2)	0.1047(3)	0.4555(2)	0.8500(2)	75(1)
O(3)	0.3310(3)	0.2948(2)	0.7632(2)	78(1)
O(4)	0.3939(3)	0.4937(2)	0.7704(2)	82(1)
C(12)	0.2004(5)	0.4658(3)	0.6224(3)	75(1)
F(1)	0.3288(5)	0.4316(2)	0.5348(2)	157(1)
F(2)	0.1482(3)	0.5841(2)	0.6054(2)	104(1)
F(3)	0.0658(5)	0.4197(3)	0.6127(3)	159(1)
N(3)	0.0615(5)	0.1510(4)	0.5030(4)	130(2)
C(13)	-0.0683(5)	0.1699(3)	0.5632(3)	77(1)
C(14)	-0.2350(5)	0.1954(5)	0.6420(4)	112(2)

Supporting Table S35. Hydrogen coordinates and isotropic displacement parameters ($Å^2$ x 10^3) for $[Ru(\eta^4\text{-}C_5H_4O)(\eta^5\text{-}C_5H_5)(SC(NH_2)_2]CF_3SO_3\cdot CH_3CN$ (**4**·CH_3CN).

	x	y	z	U_{iso}
H(1)	0.1718	0.2885	0.3197	109
H(2)	0.3416	0.4327	0.1926	101
H(3)	0.4536	0.3499	-0.0060	99
H(4)	0.3453	0.1612	-0.0065	106
H(5)	0.1661	0.1257	0.1912	117
H(7)	0.6190(4)	-0.0689(9)	0.2710(2)	63
H(8)	0.3777	0.0613	0.3976	83
H(9)	0.4716	0.2550	0.4148	90
H(10)	0.7770(3)	0.2448(19)	0.2950(3)	73
H(1A)	0.8945	0.3808	0.0032	72
H(1B)	0.7411	0.3460	0.0879	72
H(2A)	1.0575	0.2523	-0.1370	70
H(2B)	1.0111	0.1338	-0.1442	70
H(14A)	-0.2296	0.1435	0.7135	168
H(14B)	-0.3268	0.1818	0.6038	168
H(14C)	-0.2611	0.2782	0.6619	168

Hydrogen atoms were inserted in idealized positions and were refined riding with the atoms to which they were bonded. All hydrogen atoms had $U_{iso} = U_{eq}$ x 1.2 of their carrier atoms ($U_{iso} = U_{eq}$ x 1.5 for CH_3). H(7) and H(10) were refined in x,y,z with a fixed distance C-H = 0.93 Å.

Supporting Table S36. Anisotropic displacement parameters ($Å^2$ x 10^3) for $[Ru(\eta^4\text{-}C_5H_4O)(\eta^5\text{-}C_5H_5)\ (SC(NH_2)_2]CF_3SO_3\cdot CH_3CN$ (**4**·CH_3CN). The anisotropic displacement factor exponent takes the form: $-2\pi^2 [h^2 a^{*2} U_{11} + ... + 2 h k a^* b^* U_{12}]$

	U_{11}	U_{22}	U_{33}	U_{23}	U_{13}	U_{12}
Ru	36(1)	39(1)	50(1)	-2(1)	-8(1)	-7(1)
C(1)	44(2)	109(3)	96(2)	14(2)	-4(2)	16(2)
C(2)	64(2)	49(2)	142(3)	-1(2)	-48(2)	6(1)
C(3)	53(2)	100(3)	89(2)	39(2)	-27(2)	-11(2)
C(4)	68(2)	101(3)	107(3)	-15(2)	-51(2)	-5(2)
C(5)	46(2)	76(2)	175(4)	40(3)	-44(2)	-24(2)
O(1)	39(1)	58(1)	74(1)	-5(1)	-12(1)	-4(1)
C(6)	45(1)	48(1)	48(1)	-2(1)	-14(1)	-4(1)
C(7)	47(1)	46(1)	59(1)	7(1)	-4(1)	-8(1)
C(8)	54(2)	86(2)	51(1)	10(1)	2(1)	3(1)
C(9)	75(2)	86(2)	51(2)	-24(1)	-19(1)	24(2)

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C(10)	67(2)	51(1)	71(2)	-19(1)	-33(1)	0(1)
S(1)	53(1)	41(1)	49(1)	-8(1)	-1(1)	-21(1)
C(11)	43(1)	40(1)	53(1)	2(1)	-13(1)	-13(1)
N(1)	62(1)	43(1)	79(2)	-10(1)	-6(1)	-22(1)
N(2)	53(1)	53(1)	68(1)	-2(1)	4(1)	-23(1)
S(2)	53(1)	40(1)	56(1)	-4(1)	-7(1)	-15(1)
O(2)	73(1)	79(1)	69(1)	-10(1)	10(1)	-24(1)
O(3)	93(2)	41(1)	95(2)	0(1)	-20(1)	-4(1)
O(4)	77(1)	81(1)	102(2)	-7(1)	-18(1)	-43(1)
C(12)	110(3)	50(2)	65(2)	-10(1)	-19(2)	-15(2)
F(1)	242(4)	119(2)	61(1)	-24(1)	21(2)	29(2)
F(2)	157(2)	59(1)	88(1)	7(1)	-40(1)	2(1)
F(3)	234(3)	150(2)	156(2)	20(2)	-130(3)	-98(2)
N(3)	100(3)	136(3)	113(3)	29(2)	29(2)	3(2)
C(13)	74(2)	82(2)	68(2)	11(2)	-8(2)	-11(2)
C(14)	64(2)	172(4)	89(3)	8(3)	-10(2)	-11(2)

Supporting Table S37. Complete bond lengths [Å] and angles [deg] for $[Ru(\eta^4\text{-}C_5H_4O)(\eta^5\text{-}C_5H_5)(SC(NH_2)_2]CF_3SO_3\cdot CH_3CN$ ($\mathbf{4}\cdot CH_3CN$).

Bond lengths	
Ru-C(9)	2.151(3)
Ru-C(8)	2.160(3)
Ru-C(1)	2.193(3)
Ru-C(3)	2.202(3)
Ru-C(4)	2.208(3)
Ru-C(2)	2.213(3)
Ru-C(5)	2.217(3)
Ru-C(10)	2.249(2)
Ru-C(7)	2.259(2)
Ru-S(1)	2.3988(9)
Ru-C(6)	2.588(2)
C(1)-C(5)	1.401(6)
C(1)-C(2)	1.412(5)
C(2)-C(3)	1.380(5)
C(3)-C(4)	1.395(5)
C(4)-C(5)	1.376(6)
O(1)-C(6)	1.229(3)
C(6)-C(10)	1.465(3)
C(6)-C(7)	1.478(3)
C(7)-C(8)	1.394(4)
C(8)-C(9)	1.426(5)
C(9)-C(10)	1.407(4)
S(1)-C(11)	1.731(2)
C(11)-N(2)	1.309(3)
C(11)-N(1)	1.322(3)
S(2)-O(4)	1.424(2)
S(2)-O(3)	1.428(2)
S(2)-O(2)	1.437(2)
S(2)-C(12)	1.814(3)
C(12)-F(1)	1.296(4)
C(12)-F(3)	1.308(4)
C(12)-F(2)	1.321(3)
N(3)-C(13)	1.101(4)
C(13)-C(14)	1.423(5)

Bond angles	
C(9)-Ru-C(8)	38.65(13)
C(9)-Ru-C(1)	88.82(14)
C(8)-Ru-C(1)	90.59(12)
C(9)-Ru-C(3)	134.19(15)
C(8)-Ru-C(3)	152.17(12)
C(1)-Ru-C(3)	61.65(13)
C(9)-Ru-C(4)	149.81(14)
C(8)-Ru-C(4)	129.37(15)
C(1)-Ru-C(4)	61.48(15)
C(3)-Ru-C(4)	36.90(14)
C(9)-Ru-C(2)	99.00(14)
C(8)-Ru-C(2)	120.42(14)
C(1)-Ru-C(2)	37.38(13)
C(3)-Ru-C(2)	36.44(14)
C(4)-Ru-C(2)	61.29(14)
C(9)-Ru-C(5)	115.49(17)
C(8)-Ru-C(5)	96.05(14)
C(1)-Ru-C(5)	37.04(15)
C(3)-Ru-C(5)	61.10(13)
C(4)-Ru-C(5)	36.22(15)
C(2)-Ru-C(5)	61.54(13)
C(9)-Ru-C(10)	37.22(11)
C(8)-Ru-C(10)	62.90(12)
C(1)-Ru-C(10)	120.98(14)
C(3)-Ru-C(10)	131.57(13)
C(4)-Ru-C(10)	167.54(14)
C(2)-Ru-C(10)	112.35(11)
C(5)-Ru-C(10)	152.67(16)
C(9)-Ru-C(7)	62.24(11)
C(8)-Ru-C(7)	36.69(10)
C(1)-Ru-C(7)	123.98(12)
C(3)-Ru-C(7)	163.39(14)
C(4)-Ru-C(7)	128.75(13)
C(2)-Ru-C(7)	157.10(14)
C(5)-Ru-C(7)	112.69(11)
C(10)-Ru-C(7)	61.51(10)
C(9)-Ru-S(1)	126.39(8)
C(8)-Ru-S(1)	122.07(8)
C(1)-Ru-S(1)	143.56(11)
C(3)-Ru-S(1)	84.25(10)
C(4)-Ru-S(1)	83.80(11)
C(2)-Ru-S(1)	117.19(12)
C(5)-Ru-S(1)	116.21(15)
C(10)-Ru-S(1)	90.59(8)
C(7)-Ru-S(1)	85.53(7)
C(9)-Ru-C(6)	57.65(9)
C(8)-Ru-C(6)	57.86(9)
C(1)-Ru-C(6)	145.14(12)
C(3)-Ru-C(6)	149.02(10)
C(4)-Ru-C(6)	149.52(12)
C(2)-Ru-C(6)	146.45(11)
C(5)-Ru-C(6)	147.37(10)
C(10)-Ru-C(6)	34.37(8)
C(7)-Ru-C(6)	34.68(8)
S(1)-Ru-C(6)	71.29(6)
C(5)-C(1)-C(2)	107.4(3)
C(5)-C(1)-Ru	72.43(18)
C(2)-C(1)-Ru	72.08(17)