SUPPORTING INFORMATION

The dominant elementary reactions in this study are：

R353 $CH_3OCH_3(+M)<=>CH_3+CH_3O(+M)$
R354 $CH_3OCH_3+OH<=>CH_3OCH_2+H_2O$
R355 $CH_3OCH_3+H<=>CH_3OCH_2+H_2$
R356 $CH_3OCH_3+O<=>CH_3OCH_2+OH$
R359 $CH_3OCH_3+CH_3<=>CH_3OCH_2+CH_4$
R365 $CH_3OCH_2<=>CH_2O+CH_3$
R63 $CH_3O(+M)<=>CH_2O+H(+M)$
R64 $CH_3O+O_2<=>CH_2O+HO_2$
R67 $CH_3O+CH_3<=>CH_2O+CH_4$
R668 $C_4H10(+M)<=>2C_2H_5(+M)$
R669 $C_4H_{10}(+M)<=>NC_3H_7+CH_3(+M)$
R163 $C_2H_4+H(+M)<=>C_2H_5(+M)$
R167 $CH_3+C_2H_5<=>CH_4+C_2H_4$
R184 $C_2H_5+O_2<=>C_2H_4+HO_2$
R455 $NC_3H_7<=>CH_3+C_2H_4$
R456 $NC_3H_7<=>H+C_3H_6$
R682 $C_4H_{10}+H<=>PC_4H_9+H_2$
R683 $C_4H_{10}+H<=>SC_4H_9+H_2$
R684 $C_4H_{10}+OH<=>PC_4H_9+H_2O$
R685 $C_4H_{10}+OH<=>SC_4H_9+H_2O$
R686 $C_4H_{10}+O<=>PC_4H_9+OH$
R687 $C_4H_{10}+O<=>SC_4H_9+OH$
R716 $SC_4H_9<=>C_3H_6+CH_3$
R715 $PC_4H_9<=>C_2H_5+C_2H_4$