S1 Table. Raman peak assignment. Unassigned peaks were detected in pure component analysis (see Fig. 1) but lack assignment in literature. If reduced (red) and oxidized (ox) species can be differentiated, it is mentioned in the table. For molecular schemes, please see references.

Component	Raman shift (cm^{-1})	Assignment	Reference
Cytochromes	775 (red)	v_{15} pyrol breathing	(1,2)
	978 (red) 987 (ox)	$v(C_c,C_d)$	(2)
	1034	v_{31}	(2)
	1235	v_{13}	(1,2)
	1274 (red)		
	1331	v_{21} or $\delta(C_aH)$	(1,2)
	1359	v_4	(1,2)
	1478		
	1531		
	1572	v_{19}	(2)
Flavins (red/ox)	528/-		
	613/616		
	736/738	Ring I deform	(3)
	801/801	Ring I deform, C_6-H bend, N_3-H bend	(3)
	1143/1153	Ring I and Ring III modes	(3)
	1257/-	Ring I modes, N_5-H, C_6-H, C_9-H bend If resonance: C_{5a}-N_5, N_3-C_4 No resonance: C_2-N_3 str	(3,4)
	1340/1344	Adenine bend, framework vibrations	(3,4)
	-/1403	N_3-C_4 str, C_{10a}-C_{4a} stretch	(4)
	1625/1629	C_6-C_7 str, C_8-C_9 str, N_5-C_{4a} str	(4)
Alginate	908	v_{sym} C-O-C	(5)
	1117		
	1175	v_{asym} C-O-C	(5)
	1222	$v_{C\text{-}O}$	(5)
	1297	$\delta_{C\text{-}H}$	(5)
	1363	$\delta_{C\text{-}H}$	(5)
	1504	v_{asym} COO^-	(5)
	1551	v_{asym} COO^-	(5)
	1673		
Phosphate	1086	v_{sym} PO_2^-	(6,7)

S1 Table references

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