SUPPORTING INFORMATION

Appendix A. Derived relative reaction rate coefficients that gave the best fits with the experimental data, as implemented according to Eq. (2).

Group	Reaction	F	k_1 [$(m^3/mol)^F \times (1/s)$]	k_2 [K]
Prim. F	T	0	1.82e+127	313000
	H_2O	2.3	1.77e+19	50300
	H_2	1	1.46e+10	25700
Prim. B	T	0	4.46e+5	15600
	H_2O	2	4.94e+16	43000
	H_2	1	1.17e+131	325000
Sec. F	T	0	225000	14800
	H_2O	2	1.03e+20	53300
	H_2	1	13700	10900
Sec. B	T	0	2.68e+6	15500
	H_2O	2	5.15e+19	51400
	H_2	1	9.08e+147	366000
Phenol	T	0	8.40e+124	340000
	H_2O	2	3.56e+21	57300
	H_2	1	5.53e+14	43300
Furan	T	0	4.40e+75	247000
	H_2O	2	1.30e+19	50500
	H_2	1	7.64e+10	34600
Toluene	T	0	1.37e+24	123000
	H_2O	2	2.05e+10	30700
	H_2	1	8.24e+39	114000
Benzene	T	0	2.75e+29	120000
	H_2O	2	3.4e+7	25900
	H_2	1	2.65e+36	159000
Naphthalene	T	0	2.73e+23	129000
	H_2O	2	5230000	23100
	H_2	1	4.28e+34	94400
Acenaphthylene	T	0	1.41e+18	69300
	H_2O	2	2.0e+5	18100
	H_2	1	4.51e+27	93900
Phenanthrene	T	0	8.75e+28	198000
	H_2O	2	249	10600
	H_2	1	1.94e+35	282000
Pyrene	T	0	3.53e+31	94100
	H_2O	2	6.97e+6	55600
	H_2	1	1.20e+47	117000