

Two-temperature Model of the Non-thermal Chemical Dissociation of CO₂

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Supporting Information for Publication

Table S1: CO vibrational levels and the corresponding energies in eV.

v	E_v (eV)	v	E_v (eV)	v	E_v (eV)	v	E_v (eV)
0	0.0000	20	4.8243	40	8.2869	60	10.3877
1	0.2735	21	5.0297	41	8.4243	61	10.4570
2	0.5437	22	5.2318	42	8.5582	62	10.5229
3	0.8104	23	5.4305	43	8.6888	63	10.5854
4	1.0738	24	5.6257	44	8.8160	64	10.6445
5	1.3337	25	5.8176	45	8.9397	65	10.7002
6	1.5902	26	6.0060	46	9.0601	66	10.7524
7	1.8434	27	6.1911	47	9.1771	67	10.8013
8	2.0931	28	6.3727	48	9.2906	68	10.8468
9	2.3394	29	6.5510	49	9.4008	69	10.8888
10	2.5823	30	6.7258	50	9.5075	70	10.9275
11	2.8218	31	6.8972	51	9.6109	71	10.9628
12	3.0580	32	7.0652	52	9.7108	72	10.9946
13	3.2907	33	7.2299	53	9.8073	73	11.0231
14	3.5200	34	7.3911	54	9.9005	74	11.0481
15	3.7459	35	7.5489	55	9.9902	75	11.0697
16	3.9684	36	7.7033	56	10.0765	76	11.0880
17	4.1874	37	7.8543	57	10.1594	77	11.1028
18	4.4031	38	8.0019	58	10.2389	78	11.1142
19	4.6154	39	8.1461	59	10.3150	79	11.1222
						80	11.1267

Table S2: O₂ vibrational levels and the corresponding energies in eV.

v	E_v (eV)	v	E_v (eV)	v	E_v (eV)	v	E_v (eV)
0	0.0000	12	2.139287	24	3.808175	36	4.8592263
1	0.1932	13	2.298086	25	3.921774	37	4.9125262
2	0.3838	14	2.453585	26	4.031073	38	4.9597961
3	0.57196	15	2.605684	27	4.1359072	39	5.000846
4	0.75745	16	2.754283	28	4.2361671	40	5.03548159
5	0.94034	17	2.899282	29	4.331757	41	5.06354858
6	1.12043	18	3.040681	30	4.4225569	42	5.08497657
7	1.29772	19	3.17838	31	4.5084468	43	5.09990256
8	1.47211	20	3.312279	32	4.5892867	44	5.10892516
9	1.64359	21	3.442378	33	4.6649366	45	5.11337385
10	1.811889	22	3.568377	34	4.7352565	46	5.11500725
11	1.977188	23	3.690376	35	4.8000764		

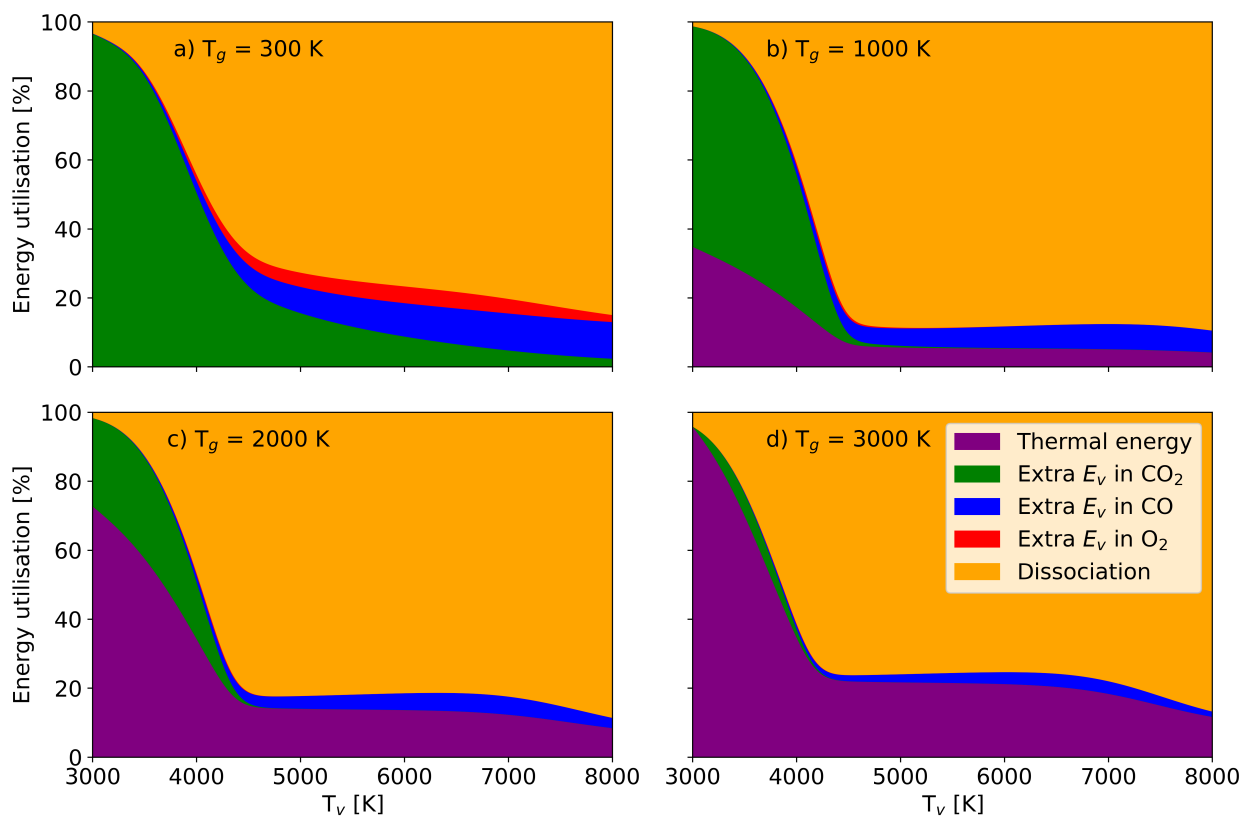


Figure S1: The energy utilisation fraction as a function of the vibrational temperature at a residence time of 1 ms, and a gas temperature of a) 300 K; b) 1000 K; c) 2000 K; and d) 3000 K.

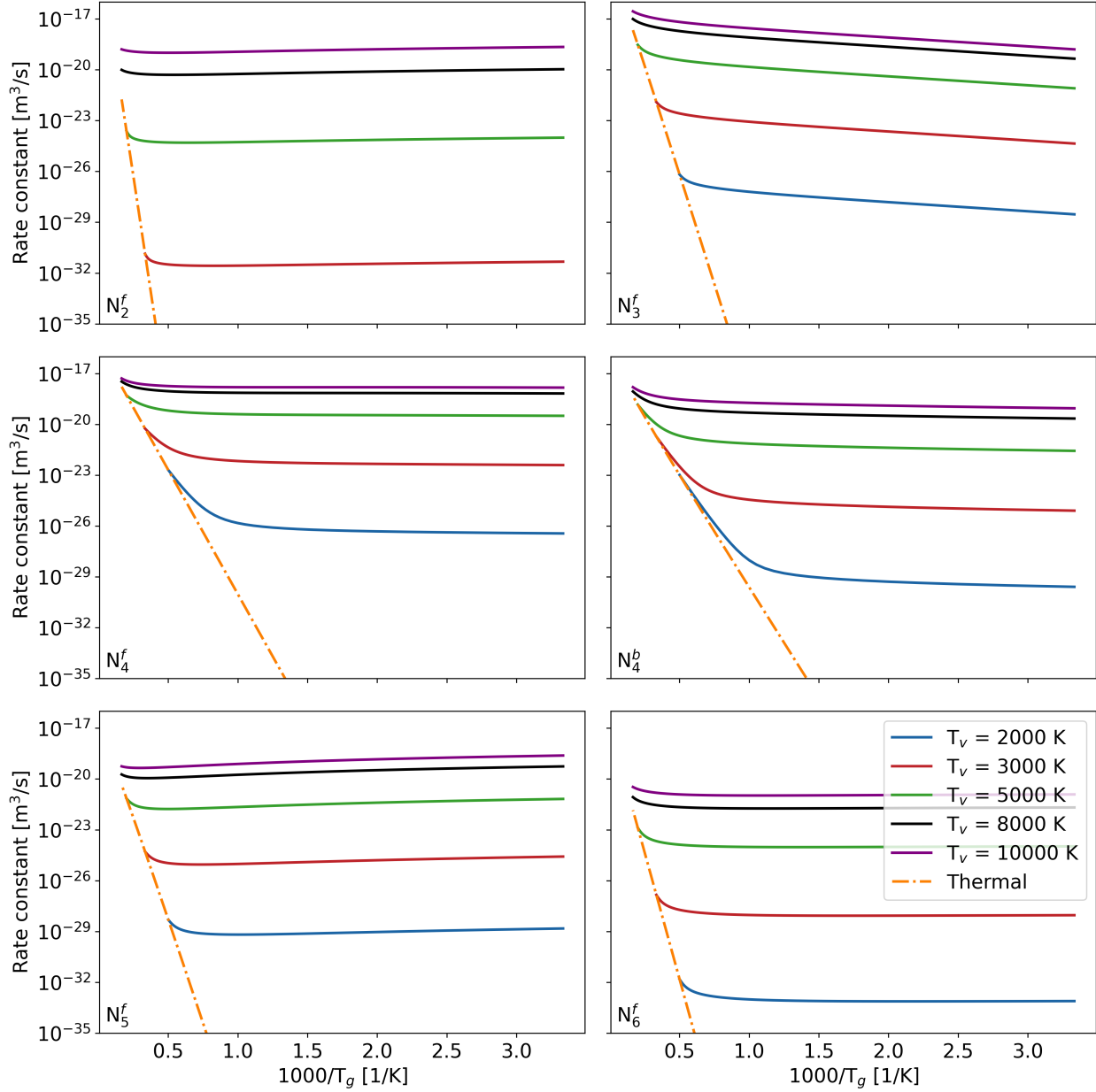


Figure S2: The overall reaction rates of N_2^f , N_3^f , N_4^f , N_4^b , N_5^f , N_6^f as a function of the gas and vibrational temperature with different vibrational temperatures. The output for rated constants of the three-body reaction is multiplied by the contraction of third bodies.