Fm 1615

A. K. Macpherson

The three-dimensional detonation polar
and an application to spinning detonation

Tables 3 and 4 to hold.

TABLE 3.

AN α_1 SOLUTION RESULTS

Shock	M_1	M_2	P_1/P_0	δ_o	ϕ_o	δ_{r1}	ϕ_{rt}	θ_{rt}	ω_{rt}	λ_{rt}	Temp. ^oK
i_1	6.41	4.131	5.88	6.54	10.58	6.54	10.58	-4.9	-3.7	53.0	655
r_1	4.131	3.06	3.4	-5.3	-11.5	13.5	0.00	-4.9	3.43	-55.0	1050
k_1	4.13	N.D.	8.27	-24.80	- 0.004	-6.58	-10.65	-13.45	-9.07	56.2	1710
t_1	6.41	0.49	48.60	-6.58	-10.65	-6.58	-10.65	52.41	-85.05	-6.5	4095
i_2	6.3	4.057	6.10	7.2	10.86	6.35	10.73	-4.62	-3.76	50.9	670
r_2	4.057	3.037	3.435	-5.34	-11.57	13.47	-0.14	-3.05	2.14	-54.9	1075
i_3	6.2	3.93	6.29	7.80	11.00	6.15	10.86	-5.53	-4.79	49.1	685
r_3	3.93	2.95	3.38	-5.42	-11.74	13.57	-0.30	-2.04	1.44	-54.8	1090
i_4	6.1	3.82	6.48	8.41	11.28	5.93	11.13	-6.42	-5.85	47.4	695
r_4	3.82	2.87	3.33	-5.51	-11.92	13.67	-0.47	-1.0	0.71	-54.7	1115
i_5	6.0	3.71	6.67	9.06	11.48	5.70	11.31	-7.26	-7.01	46.3	710
r_5	3.71	2.78	3.28	-5.58	-12.07	13.76	-0.61	0.08	-0.06	-54.5	1130
k_5	3.65	N.D.	6.16	-22.66	0.006	-8.44	-6.49	-17.26	-16.75	45.9	1565
t_5	6.0	0.52	41.15	-5.08	6.45	-8.44	-6.49	48.83	-86.40	-4.5	3770
i_6	5.9	3.60	6.87	9.78	11.63	5.49	11.45	-8.23	-8.43	44.3	720
r_6	3.60	2.70	3.23	-5.66	-12.25	13.87	-0.78	1.27	-0.92	-54.1	1140
i_7	5.8	3.48	7.08	10.49	11.82	5.21	11.62	-9.01	-9.75	42.7	730
r_7	3.48	2.62	3.18	-5.76	-12.45	13.98	-0.98	2.44	-1.79	-53.8	1155
i_8	5.7	3.37	7.29	11.23	11.98	4.93	11.77	-9.73	-11.14	42.5	750
r_8	3.37	2.54	3.13	-5.85	-12.63	14.09	-1.16	3.66	2.71	-53.5	1160
i_9	5.6	3.26	7.52	12.05	12.12	4.67	11.90	-5.53	-6.82	39.2	760
r_9	3.26	2.45	3.08	-5.94	-12.82	14.20	-1.33	5.11	-3.84	-53.2	1170
k_9	3.20	N.D.	4.53	-20.2	0.01	-9.76	-0.77	-21.09	-21.75	44.0	1410
t_9	5.6	0.56	34.04	-2.38	2.38	-9.76	-0.77	43.81	-88.27	-1.7	3525
i_{10}	5.5	3.15	7.77	12.89	12.30	4.37	12.03	-6.18	-8.08	37.4	780
r_{10}	3.15	N.D.	3.04	-6.04	-13.03	14.32	-1.53	6.44	-4.90	-52.8	1190
i_{11}	5.4	3.03	8.03	13.75	12.5	4.02	12.18	-6.77	-9.37	35.6	800
r_{11}	3.03	2.28	2.99	-6.15	-13.25	14.45	-1.74	7.95	-6.14	-52.4	1210

N.D. - Not determined.

TABLE 4

SPIN DETONATION IN CO + O_2 + H_2 MIXTURE

Shock	M_1	M_2	P_1/P_o	δ_o	ϕ_o	δ_{r1}	ϕ_{r1}	θ_{rt}	ω_{rt}	λ_{rt}	Temp. °K
i_1	6.8	4.79	5.71	6.53	11.02	6.53	11.02	-7.96	-5.64	54.6	560
r_1	4.79	3.86	3.40	-6.97	-9.75	11.28	0	-7.96	3.70	-65.2	809
t_1	6.8	0.50	52.7	-6.67	-11.26	-6.67	-11.26	49.22	-86.24	-37.2	3450
k_1	4.79	N.D.	9.22	-25.73	-0.004	-6.67	-11.26	-15.00	-9.89	-57.0	1275
i_2	6.6	4.63	6.06	7.78	11.40	6.18	11.36	-8.88	-7.29	50.5	577
r_2	4.63	3.81	3.32	-7.11	-9.93	11.33	-0.21	-4.96	2.35	-64.7	824
i_3	6.42	4.39	6.36	9.09	11.62	5.83	11.54	-11.09	-10.30	47.2	592
r_3	4.39	3.60	3.24	-7.28	-10.16	11.44	-0.47	-3.04	1.46	-64.8	837
t_3	6.42	0.51	45.55	-6.36	-7.51	-9.69	-7.57	45.88	-86.30	-33.6	3380
k_3	4.32	N.D.	7.16	-24.76	0.10	-9.69	-7.57	-19.53	-16.21	50.6	1110
i_4	6.2	4.14	6.81	10.54	12.02	5.19	11.87	-14.05	-14.52	44.0	613
r_4	4.14	3.41	3.14	-7.49	-10.44	11.56	-0.80	-0.67	-0.33	-65.1	855
i_5	6.0	3.91	7.24	12.11	12.40	4.61	12.23	-14.66	-16.82	40.8	633
r_5	3.91	3.22	3.06	-7.70	-10.73	11.70	-1.13	1.48	-0.75	-65.3	873
t_5	6.0	0.54	38.71	-3.38	-3.47	-12.26	-7.10	41.17	-88.24	-15.1	3300
k_5	3.83	N.D.	5.34	-21.96	0.008	-12.26	-7.10	-23.22	-23.31	44.9	1090
i_6	5.8	3.91	7.74	13.86	12.73	3.94	12.40	-16.29	-20.75	37.6	656
r_6	3.66	3.04	2.95	-7.98	-11.10	11.87	-1.56	4.26	-2.21	-62.6	900
i_7	5.6	3.41	8.32	15.79	13.11	3.14	12.65	-17.52	-24.74	34.4	682
r_7	3.41	2.84	2.85	-8.26	-11.47	12.04	-1.99	3.38	-1.89	-61.8	915
t_7	5.6	0.59	32.05	0.78	0.64	-11.87	0.65	34.57	89.52	0.3	3225
k_7	3.33	N.D.	3.85	-19.11	-0.002	-11.87	0.65	-26.71	-31.59	39.3	1025

TABLE 4 (Continued)

Shock	M	M	P_1/P_o	δ_o	Φ_o	δ_{rl}	Φ_{rl}	θ_{rt}	ω_{rt}	λ_{rt}	Temp ^oK
i	5.4	3.14	9.03	17.98	13.59	2.16	12.96	-18.88	-29.52	31.1	714
r	3.14	2.60	2.75	-8.56	-11.88	12.23	-2.45	10.69	-6.01	-60.8	940
i	5.2	2.86	9.92	20.56	14.29	0.99	13.42	-19.74	-33.84	28.2	754
r	2.86	2.42	2.63	-9.00	-12.48	12.51	-3.14	15.23	-9.14	-59.5	985
t	5.2	0.70	24.91	8.11	5.52	-11.46	5.58	23.30	81.96	3.5	3125
k	2.77	N.D.	2.51	-14.62	-0.006	-11.46	5.58	-30.92	-41.45	34.1	980
i	5.1	2.62	10.24	22.02	16.99	0.22	13.94	-19.51	35.39	26.5	770

N.D. - Not Determined