

Supporting Information For: “Shock Induced Chemistry In Liquids Studied With Ultrafast Dynamic Ellipsometry And Visible Transient Absorption Spectroscopy”

N. C. Dang, C. A. Bolme, D. S. Moore, and S. D. McGrane
Shock and Detonation Physics Group, Los Alamos National Laboratory, Los Alamos, New
Mexico 87545, USA*

This supporting information provides data determined from the ultrafast dynamic ellipsometry fits for acetonitrile, acrylonitrile cyclohexane, benzene, cyclohexene, 1,3-cyclohexadiene, phenylacetylene, *tert*-butyl acetylene, and water. Particle velocities (u_p), shock velocities (u_s) and shock refractive indices (n_s) are given in Tables SI1 to SI9.

* Corresponding author, dangnc@lanl.gov

Table SI1: Particle velocities, shock velocities and shock refractive indices of acetonitrile

u_p (km/s)	u_s (km/s)	n_s	u_p (km/s)	u_s (km/s)	n_s
1.88	4.52	1.64	1.95	4.49	1.64
1.93	4.75	1.61	1.96	4.64	1.62
1.93	4.8	1.61	1.97	4.60	1.63
1.94	4.73	1.62	1.98	4.61	1.64
1.97	4.76	1.63	1.99	4.64	1.63
2.01	4.79	1.65	2.00	4.56	1.64
2.01	4.82	1.64	2.01	4.67	1.64
2.04	4.83	1.65	2.06	4.72	1.64
2.05	4.72	1.68	2.07	4.64	1.67
2.2	5.02	1.67	2.50	5.51	1.66
2.54	5.54	1.71	2.56	5.49	1.69
2.71	5.75	1.73	2.57	5.62	1.65
2.78	6.01	1.75	2.61	5.67	1.66
2.86	5.89	1.75	2.68	5.67	1.68
2.93	6.28	1.71	2.71	5.66	1.70
3.02	6.15	1.77	2.71	5.78	1.68
3.11	6.44	1.74	2.72	5.69	1.71
3.15	6.39	1.78	2.74	5.81	1.69
3.26	6.6	1.79	2.84	6.05	1.74
3.27	6.56	1.77	2.85	5.90	1.71
3.29	6.68	1.78	2.95	6.32	1.67
3.39	6.76	1.79	2.98	6.10	1.73
			3.00	6.21	1.71
			3.04	6.24	1.70
			3.14	6.36	1.72
			3.19	6.18	1.79
			3.20	6.45	1.73
			3.21	6.59	1.72
			3.22	6.35	1.75
			3.23	6.39	1.74
			3.23	6.28	1.79
			3.24	6.54	1.74
			3.27	6.78	1.71

Table SI2: Particle velocities, shock velocities and shock refractive indices of Acrylonitrile

u_p (km/s)	u_s (km/s)	n_s	u_p (km/s)	u_s (km/s)	n_s
1.69	4.91	1.62	2.06	4.77	1.72
1.77	4.54	1.63	2.12	5.01	1.64
1.81	4.50	1.69	2.46	5.82	1.69
1.85	4.61	1.65	2.64	5.89	1.75
1.87	4.69	1.65	2.77	5.80	1.80
1.89	4.55	1.69	2.81	5.73	1.82
1.92	4.76	1.66	2.82	5.83	1.80
1.94	4.60	1.70	2.83	5.72	1.84
1.95	4.79	1.67	2.83	5.81	1.81
1.95	4.79	1.67	2.84	5.84	1.80
1.96	4.55	1.73	2.85	5.79	1.81
1.97	4.61	1.71	2.86	5.80	1.82
1.99	4.55	1.73	2.87	5.88	1.81
1.99	4.71	1.70	2.87	5.86	1.82
2.00	4.59	1.72	2.94	5.90	1.83
2.02	4.74	1.71	2.95	5.86	1.85
2.04	4.73	1.73	2.95	5.92	1.84
2.05	4.68	1.74			

Table SI3: Particle velocities, shock velocities and shock refractive indices of benzene

u_p (km/s)	u_s (km/s)	n_s	u_p (km/s)	u_s (km/s)	n_s
1.46	4.08	1.74	2.37	5.53	1.92
1.48	4.28	1.75	2.39	6.02	1.86
1.55	4.54	1.77	2.40	5.94	1.90
1.56	4.48	1.77	2.49	5.95	1.93
1.56	4.54	1.75	2.51	6.07	1.90
1.57	4.42	1.78	2.57	6.11	1.92
1.58	4.51	1.77	2.59	5.79	1.97
1.59	4.66	1.76	2.61	5.80	1.98
1.59	4.48	1.79	2.62	5.72	2.01
1.60	4.43	1.80	2.63	5.79	1.98
1.72	4.73	1.80	2.65	6.20	1.93
1.76	4.60	1.84	2.67	5.31	2.02
1.76	4.72	1.82	2.67	6.15	1.97
1.77	4.62	1.85	2.69	6.07	2.01
1.77	4.68	1.84	2.71	5.87	2.02
1.78	4.64	1.85	2.71	6.17	1.95
1.79	4.69	1.84	2.72	6.16	1.96
1.81	4.29	1.81	2.72	6.05	2.02
1.82	4.69	1.86	2.76	5.81	2.05
1.91	4.74	1.89	2.80	6.24	1.98
2.05	5.68	1.83	2.83	6.21	2.00
2.11	5.55	1.79	2.85	6.25	2.00
2.20	5.40	1.89	2.86	6.41	1.99
2.22	6.00	1.81	2.87	6.26	1.99
2.23	5.57	1.84	2.88	6.28	2.02
2.23	6.07	1.78	2.90	6.27	2.02
2.27	5.79	1.89	2.92	6.65	1.93
2.27	5.93	1.84	2.96	6.53	2.00
2.28	5.53	1.89	2.97	6.50	2.03
2.29	5.89	1.86	3.03	6.49	2.02
2.33	5.58	1.89	3.04	6.43	2.03
2.33	5.63	1.87	3.07	6.52	2.04
2.36	5.85	1.91	3.33	6.74	2.11

Table SI4: Particle velocities, shock velocities and shock refractive indices of cyclohexane

u_p (km/s)	u_s (km/s)	n_s	u_p (km/s)	u_s (km/s)	n_s
1.71	4.65	1.68	2.69	5.98	1.81
1.73	4.6	1.71	2.70	5.97	1.83
1.77	4.74	1.69	2.70	6.08	1.80
1.77	4.74	1.69	2.73	6.05	1.82
1.77	4.68	1.71	2.73	6.10	1.81
1.82	4.69	1.73	2.74	5.97	1.84
1.88	4.77	1.74	2.75	5.98	1.84
1.89	4.77	1.74	2.79	6.54	1.76
1.89	4.86	1.73	2.81	6.33	1.85
1.89	4.86	1.73	2.99	6.62	1.84
2.00	4.90	1.76	3.00	6.61	1.85
2.19	5.60	1.70	3.13	6.85	1.80
2.19	5.60	1.70	3.15	6.89	1.81
2.49	5.88	1.76	3.16	6.74	1.85
2.51	5.88	1.77	3.21	6.73	1.87
2.56	5.81	1.80	3.25	6.91	1.84
2.60	5.84	1.83	3.27	6.91	1.84
2.64	6.18	1.76			

Table SI5: Particle velocities, shock velocities and shock refractive indices of cyclohexene

u_p (km/s)	u_s (km/s)	n_s
1.79	4.99	1.69
1.79	4.73	1.73
1.86	4.78	1.74
1.86	4.79	1.75
1.82	4.85	1.71
1.88	4.90	1.74
1.76	4.90	1.67
2.03	5.02	1.79
2.42	5.76	1.80
2.41	5.76	1.79
2.57	5.85	1.83
2.53	5.89	1.82
2.57	5.92	1.81
2.69	5.98	1.85
2.60	6.06	1.80
2.71	6.12	1.83
2.78	6.15	1.85
2.79	6.15	1.86
2.90	6.18	1.89
2.80	6.22	1.84
2.80	6.23	1.86
2.75	6.27	1.82
2.87	6.43	1.86
2.78	6.46	1.81
2.98	6.48	1.87
3.03	6.51	1.88

Table SI6: Particle velocities, shock velocities and shock refractive indices of

1-3 cyclohexadiene

u_p (km/s)	u_s (km/s)	n_s
1.85	4.71	1.82
1.88	4.69	1.84
1.89	4.74	1.84
1.90	4.73	1.84
1.96	4.74	1.85
2.37	5.77	1.86
2.45	5.83	1.89
2.50	5.64	1.91
2.51	5.77	1.87
2.54	5.79	1.88
2.56	5.76	2.01
2.59	6.01	1.89
2.60	5.90	1.89
2.60	5.89	1.89
2.60	5.72	1.96
2.65	6.06	1.88
2.73	5.93	1.93
2.73	5.93	1.96
2.73	5.88	1.96
2.78	6.08	1.92
2.87	6.07	1.95
2.88	5.93	2.09
2.95	5.86	2.13
2.98	6.05	2.13
2.99	6.11	2.02

Table SI7: Particle velocities, shock velocities and shock refractive indices of phenylacetylene

u_p (km/s)	u_s (km/s)	n_s
1.47	4.21	1.84
1.64	4.20	1.90
1.71	4.74	1.89
1.75	4.77	1.90
1.82	4.91	1.91
1.83	5.01	1.87
1.83	4.85	1.92
1.90	4.95	1.93
1.93	4.83	1.98
2.00	4.86	2.00
2.02	4.91	2.00
2.23	5.55	2.00
2.36	5.49	2.07
2.36	5.60	2.05
2.48	5.75	2.10
2.53	5.75	2.07
2.66	6.06	2.08
2.67	5.61	2.21
2.69	5.72	2.19
2.79	5.99	2.18
2.90	5.99	2.20
3.05	6.19	2.22
3.14	6.12	2.30
3.17	6.17	2.34
3.21	6.30	2.27
3.31	6.21	2.39
3.33	6.22	2.37
3.34	6.32	2.35
3.37	6.13	2.45
3.49	6.26	2.47
3.52	6.40	2.41
3.54	6.38	2.45
3.57	6.25	2.57

Table SI8: Particle velocities, shock velocities and shock refractive indices of *tert*-butylacetylene

u_p (km/s)	u_s (km/s)	n_s
1.90	4.58	1.62
1.93	4.66	1.62
2.05	4.86	1.64
2.10	4.75	1.67
2.21	4.99	1.69
2.23	5.04	1.69
2.56	5.42	1.73
2.82	5.88	1.73
2.93	5.94	1.76
2.96	6.10	1.74
2.99	6.01	1.77
3.33	6.40	1.83

Table SI9: Particle velocities, shock velocities and shock refractive indices of water

u_p (km/s)	u_s (km/s)	n_s
1.81	4.75	1.53
1.83	4.61	1.55
1.90	4.73	1.57
1.90	4.65	1.57
1.90	4.69	1.57
1.93	4.87	1.56
1.95	4.71	1.59
1.99	4.77	1.60
2.75	6.25	1.56
2.87	6.32	1.58
2.88	6.30	1.59
2.93	6.30	1.59
2.98	6.35	1.61
3.06	6.47	1.58
3.10	6.65	1.62
3.25	6.68	1.56