

Supplementary Figures and Table
For
Structural changes in shocked tektite and their implications to
impact-induced glass formation
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Figure S1

Figure S2

Figure S3

Table S1

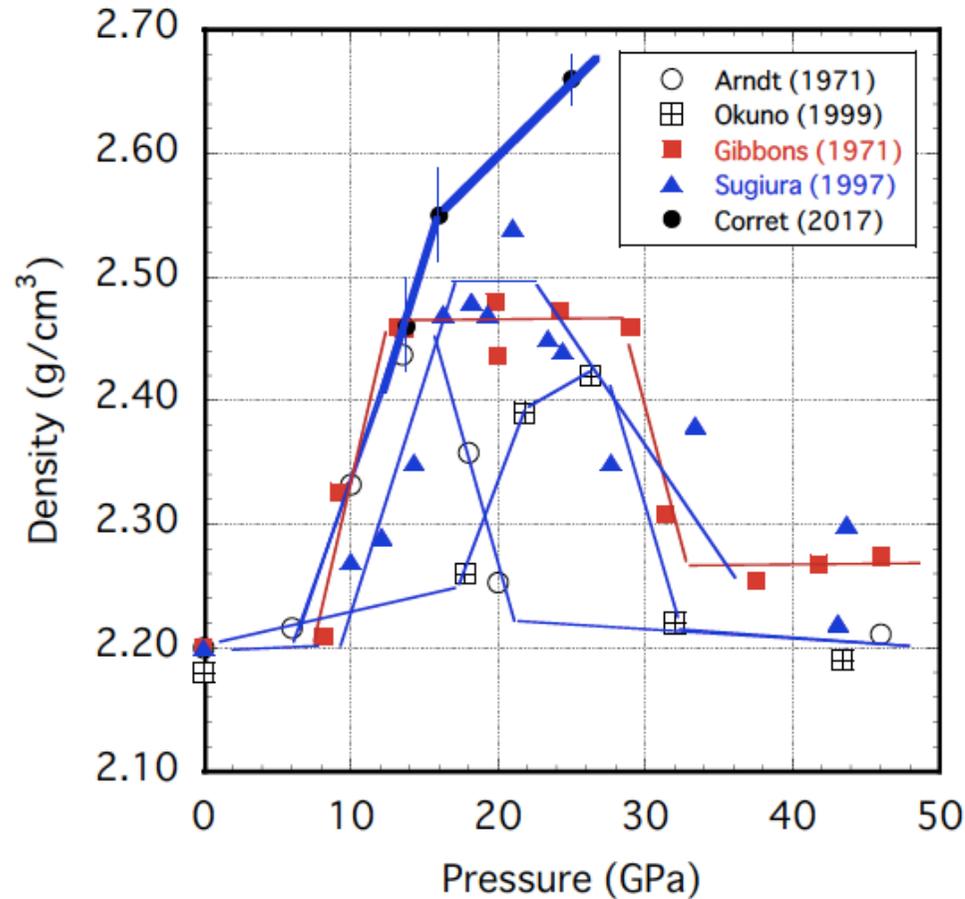


Fig. S1. A comparison of measured density of fused silica glass as a function of pressure in shock recovery and diamond cell anvils (DAC) experiments. Arndt (1971), Okuno (1999), Gibbons (1971), Sugiura (1997), and Corret (2017) are Arndt et al. (1971), Okuno et al. (1999), Gibbons and Ahrens (1971), Sugiura et al. (1997), and Corret et al. (2017), respectively. Note a maximum density around 2.47 g/cm³ in the shocked samples but no clear peak in DAC samples (Corret et al., 2017). The density in shocked samples varies with sample thickness and shock reflection within sample. Density values of Gibbons and Ahrens (1971) were calculated from the density-refractive index relation given by Arndt et al. (1971). Lines are guides to eye.

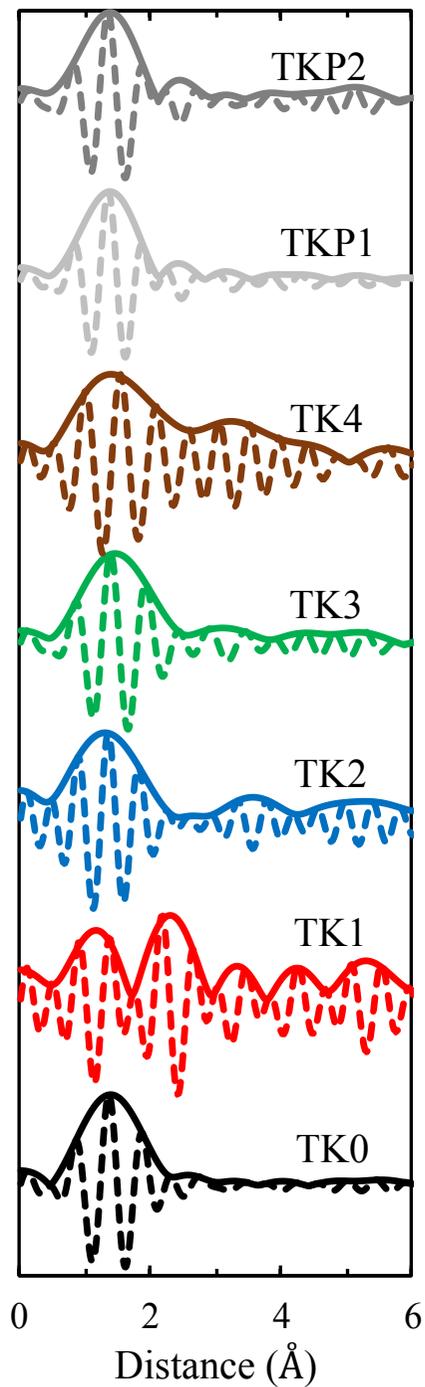


Fig. S2. Extended x-ray absorption fine structures of Ti K-edge for shock-recovered samples.

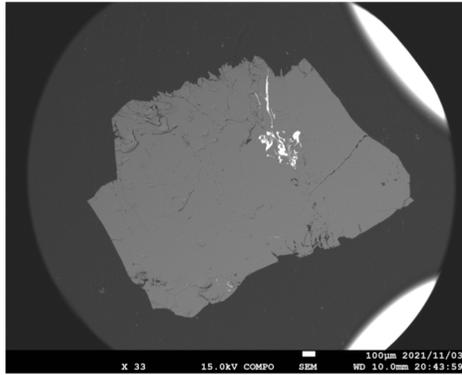
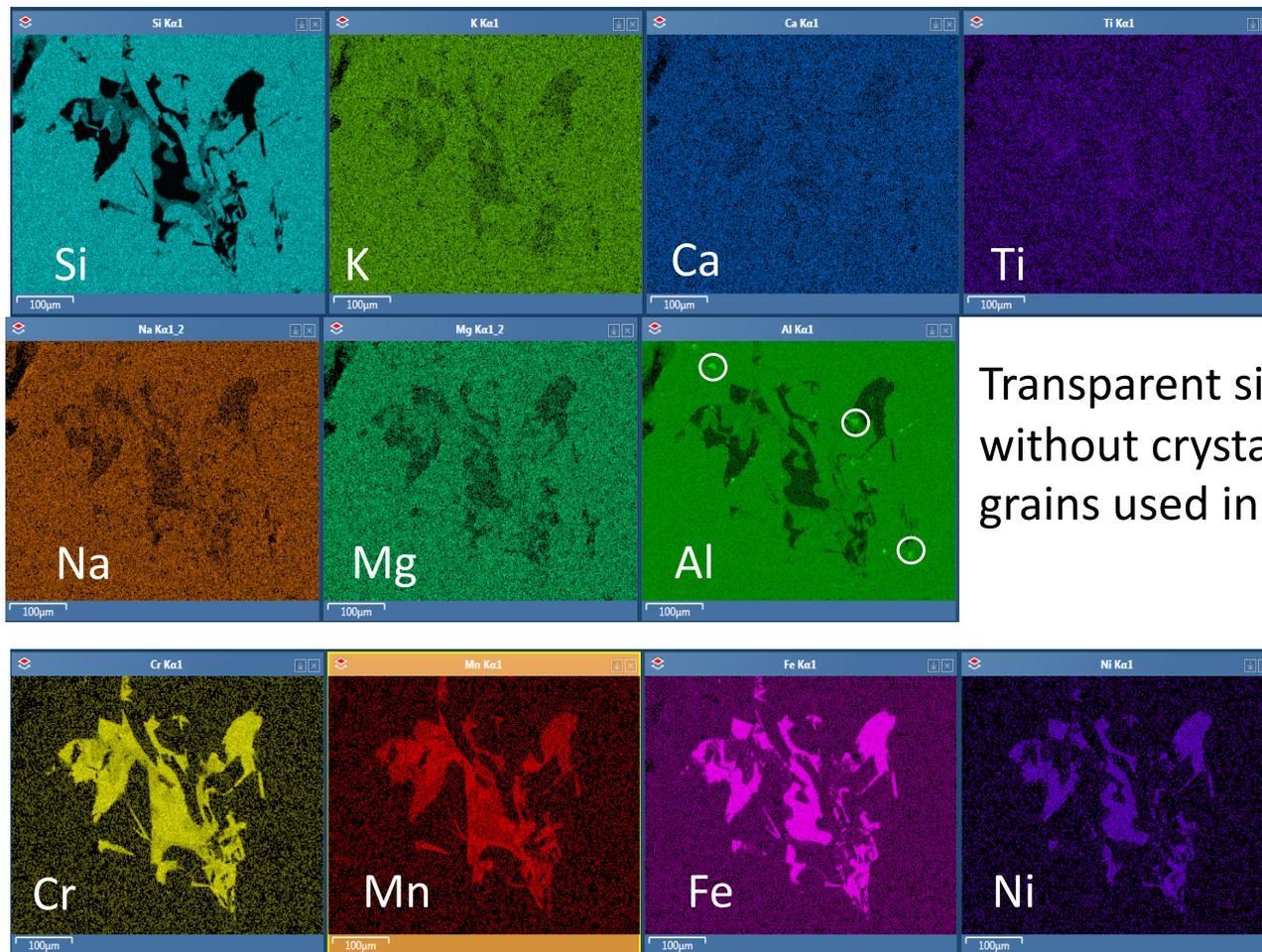


Fig. S3. SEM observations of TK4 sample. The size of specimen is ~ 2 mm x 3 mm.



Transparent silicate part is Si-rich glass without crystal except for residual alumina grains used in polishing (marked in circles).

Observed metal particles consist of Fe-Cr-Ni-Mn alloy from the sample container.

Table S1. Ti-O distances obtained by EXAFS, estimated coordination numbers and pre-edge peak positions of natural tektites cited from Wang et al. (2011, 2013).

Sample	Estimated coordination number	Pre-edge peak position (KeV)	Ti-O distance by EXAFS (Å)	R-factor (%)	Reference	
Tektite	Indochinite	4	4.9679	1.812 (5)	4.3	Wang et al. (2011)
	Moldavite-brownish	4	4.9679	1.817 (4)	6.3	
	Bediasite	4	4.9679	1.835 (3)	0.7	
	Hainanite	5	4.9679	1.888 (6)	0.1	
	Australite	5	4.9679	1.892 (4)	3.5	
	Philippinite	5	4.9679	1.921 (5)	2.7	
Volcanic glass	Moldavite-green	6	4.9679	2.001 (4)	3.5	Wang et al. (2013)
	Obsidian	6	4.9676	1.969 (2)	0.9	
	Perlite	5	4.9684	1.902 (1)	0.5	
Impact glass	Kofelsite	5	4.9688	1.983 (3)	2.1	
	Impactite	5	4.9688	1.952 (2)	0.2	
	Suevite	5	4.9684	1.887 (2)	2.5	