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Supplementary Materials for

Plagioclase under compression: A path to diaplectic glass and maskelynite

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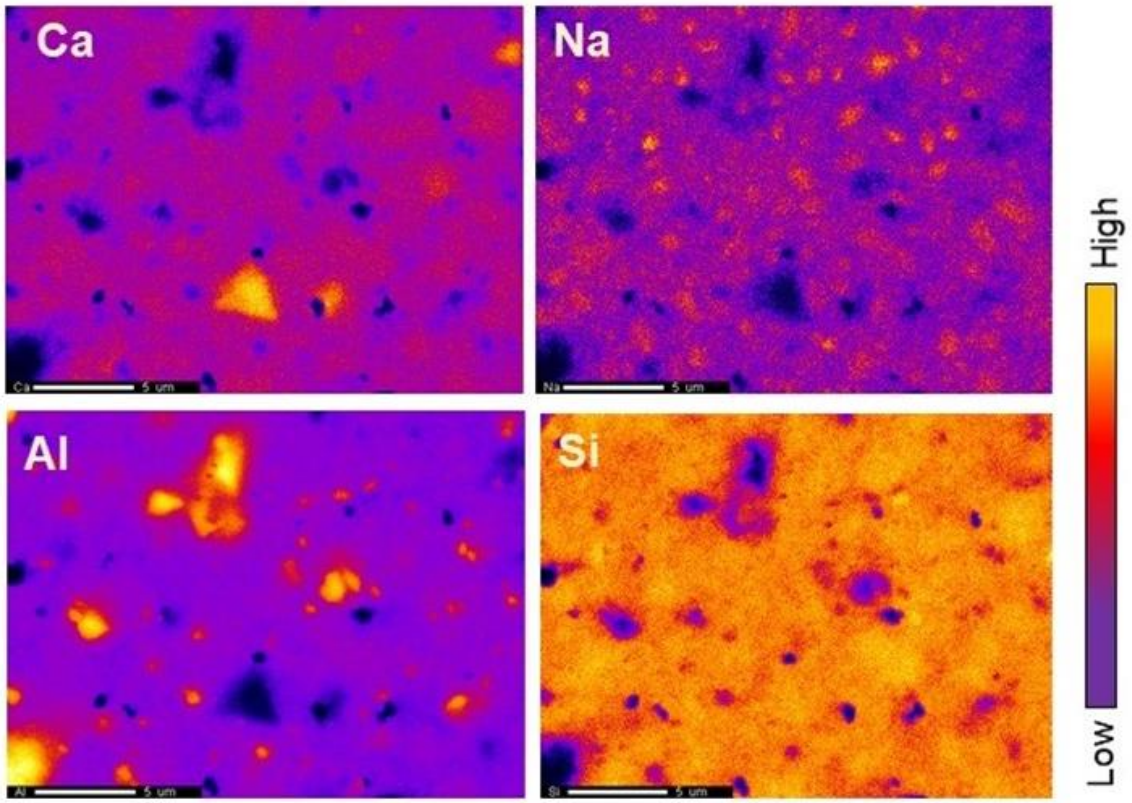

Figure S1. Element distribution of a heating spot. Element mapping of one heating spot (20 x 20 μm) associated with the quenched sample at 1 bar in Fig 1. From top to bottom shows the enrichment of cacium (Ca), sodium (Na), aluminium (Al), and silicon (Si); color scale bar on the right shows concentrations. The scale bar is 5μm.

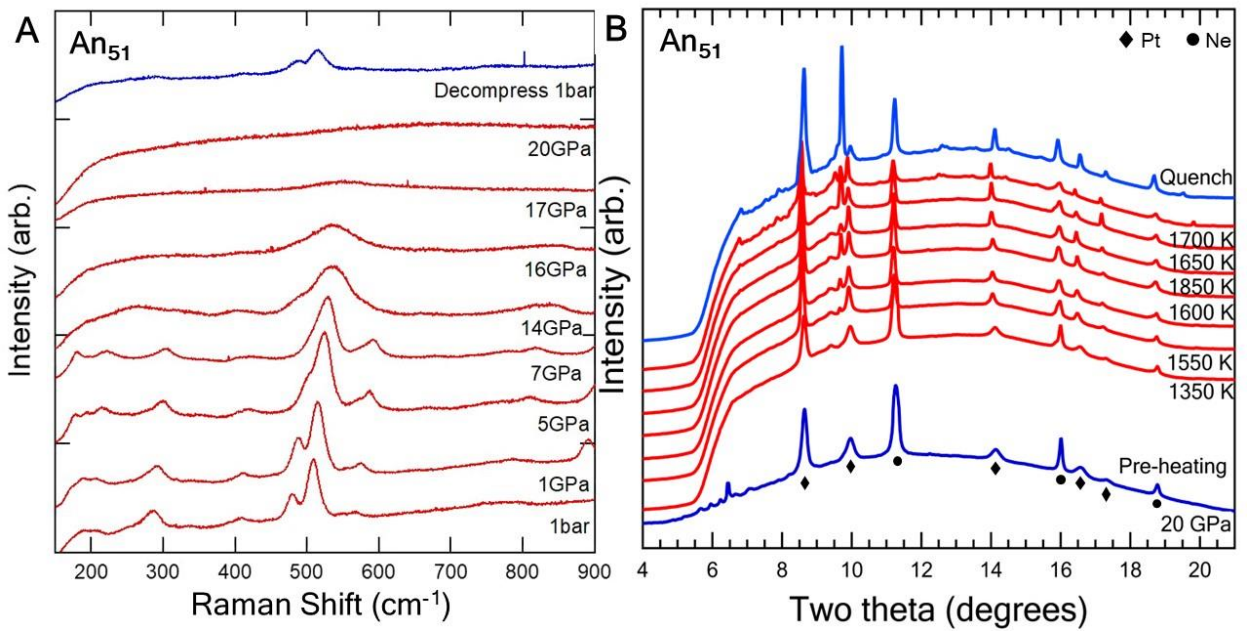

Figure S2. Amorphization of labradorite. (A) Raman spectra collected from labradorite An_{51} at 1 bar - 20 GPa and room temperature, showing the disappearance of the characteristic doublet peaks around 500 cm^{-1}, ν_s(T-O-T) (symmetric T-O-T stretching) modes (T= Si or Al) (*54*) and the process of amorphization. The top spectrum was collected after decompression to 1 bar, and the main doublet feature was observed. This suggests part of the SiO_4 framework structure can be retained after decompression. **(B)** Synchrotron X-ray diffraction pattern collected from the heating circle at 19 GPa and temperatures from 1350 to 1700K, together with the quenched pattern after heating. In the pre-heating pattern at 20 GPa, the peaks below 8 degrees are from partially amorphous labradorite An_{51}. As temperature increases, disappearance of these peaks suggests the complete amorphization of labradorite. Pt: platinum, pressure marker, Ne: neon, pressure medium.

Table S1. Chemical composition of intermediate plagioclase labradorite An_{51} and anorthite An_{96} obtained by EPMA. wt% = mean composition in weight%; An-Ab-Or content in mol%.

	Labradorite	Anorthite
Location	Labrador, Canada	Miyake-Jima, Tokyo, Japan
	wt%	wt%
SiO_2	56.23	44.57
Al_2O_3	27.99	35.49
Na_2O	5.25	0.45
CaO	10.47	19.15
K_2O	0.39	0.02
FeO	0.23	0.39
MgO	0.01	0.09
TiO_2	0.01	0.01
BaO	0.02	0.00
Total	100.58	100.17
An	51.25	95.83
Ab	46.48	4.08
Or	2.26	0.09

Table S2. Composition, crystal structure, bulk modulus and its pressure derivative for all phases observed in this study.

Phase	Composition	Crystal structure	Space group	K_0 (GPa)	K'_0	Reference
Au	Gold	Cubic	$Fm\bar{3}m$	167	5.77(2)	(*59*)
Pt	Platinum	Cubic	$Fm\bar{3}m$	277	4.95(2)	(*59*)
Jadeite	$NaAlSi_2O_6$	Monoclinic	*C12/c1*	125.0	5.0	(*64*)
Stishovite	SiO_2	Tetragonal	$P4_2/mnm$	304	4.6(1)	(*65*)
$CaCl_2$-type SiO_2	SiO_2	Orthorhombic	*Pnnm*	302	5.24(9)	(*50*)
CAS	$CaAl_4Si_2O_{11}$	Hexagonal	$P6_3/mmc$	171	5.1	(*66, 67*)
Ca-Perovskite	$CaSiO_3$	Cubic	$Pm\bar{3}m$	223(6)	4.0	(*68*)
Corundum	Al_2O_3	Hexagonal	$R\bar{3}c$	252.9	4.251	(*69*)
Grossular	$Ca_3Al_2Si_3O_{12}$	Cubic	$Ia\bar{3}d$	166.5	4.96	(*70*)
CF	$NaAlSiO_4$	Orthorhombic	*Pbnm*	220	4.1	(*71*)

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