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Supporting information for article:

A high-temperature, high-pressure small-angle neutron scattering cell for studying hydrothermal reactions in supercritical water

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Table S1 Mechanical and neutron properties of materials used as windows for high-pressure cells

	Units	Ti- 6Al- 4V ^{a)}	Ti ^{a)}	SUS304 ^{a)}	A7075 ^{a)}	Qz ^{b)}	Sapphire ^{c)}
Density	g/cm ³	4.43	4.51	7.90	2.80	2.2	3.987
Tensile strength	MPa	895	340-510	520	540	48	-
Bending strength	MPa	-	-	-	-	105	910
Young's modulus	GPa	110	106.3	199.9	-	72	460
Melting point	°C	1650	1668	1400–1420	476–638	1660	2040
Thermal conductivity (20 °C)	W/mK	7.5	17	16	130	1.5	41 (0 °C)
Thermal expansion coefficient (20 °C)	/K×10 ⁻⁶	8.8	8.4	17.0	23.6	0.5	7.6 (200 °C)
Attenuation coefficient ^{d)}							
@1 Å	mm ⁻¹	0.041	0.044	0.104	0.011	0.024	0.038
@5 Å		0.112	0.121	0.158	0.015	0.024	0.040

^{a)} Information cited from the website of the Japan Titanium Society website (http://www.titan-japan.com/technology/physical_properties.html)

^{b)} Information cited from the EIKOH Co., Ltd. website (https://eikoh-kk.co.jp/tecdata/silicaglass_data.html)

^{c)} Information cited from the SHINKOSHA Co., Ltd. website (<https://www.shinkosha.com/english/techinfo/feature/>)

^{d)} Calculated by the neutron activation and scattering calculator hosted by NIST (<https://www.ncnr.nist.gov/resources/activation/>)

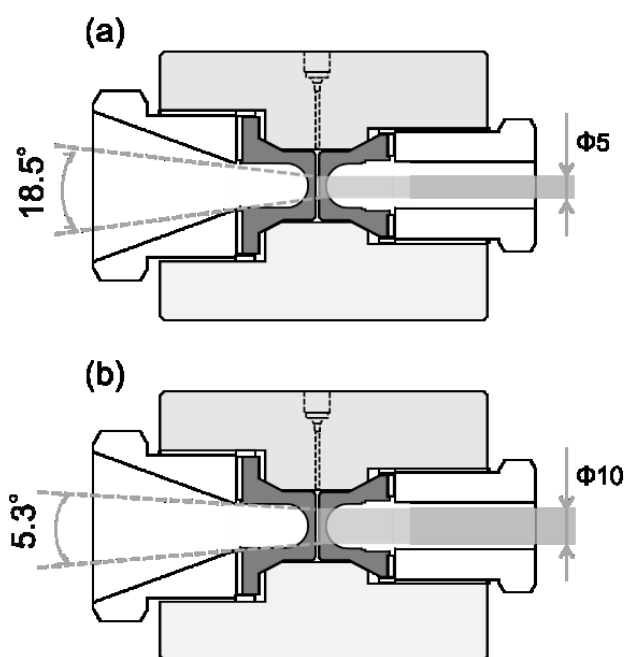


Figure S1 Scattering angle ranges for incident neutron beams (a) 5 and (b) 10 mm in diameter. Lengths are in millimeters.

Table S2 Detector bank information for TAIKAN

Detector bank	L_2 (m)	θ -range (°)	Q -range (\AA^{-1})
Small-angle	5.65	0.36–12.5	0.005–1.95
Middle-angle	3.5	11.5–24.4	0.16–3.79
High-angle	1.2	23.7–50.0	0.33–7.59
Backward	0.6	140–162	1.51–17.73

L_2 : sample-to-detector distance. θ : scattering angle.

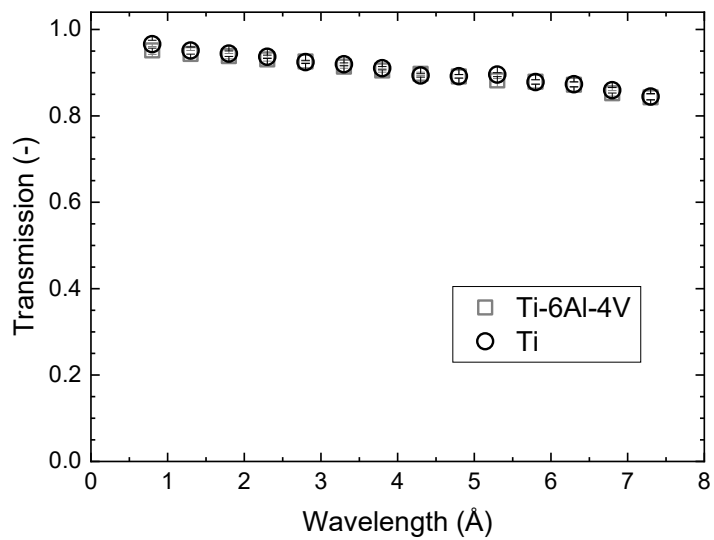


Figure S2 Neutron transmission of 1-mm-thick Ti-6Al-4V plate and Ti plate measured at TAIKAN.

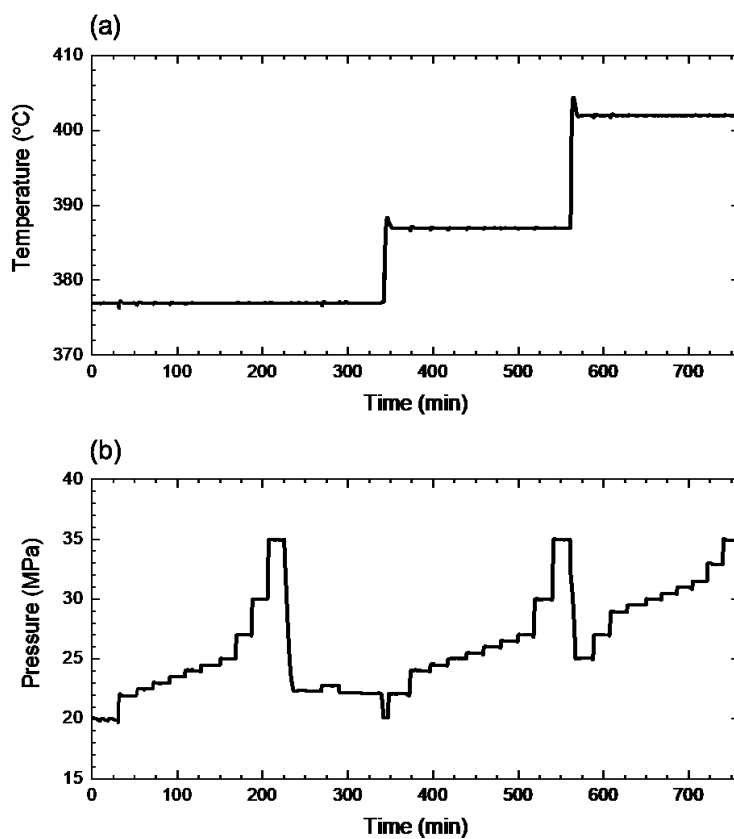


Figure S3 (a) Temperature and (b) pressure variation during SANS experiments in supercritical D₂O. The temperature was maintained at 377, 387, and 402 °C, while the pressure was varied from 20 to 35 MPa.