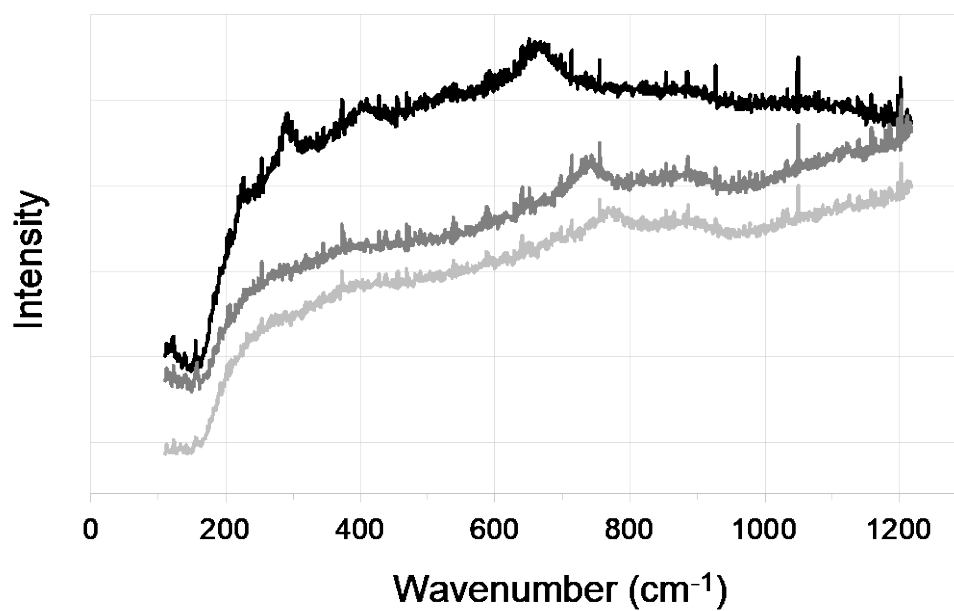
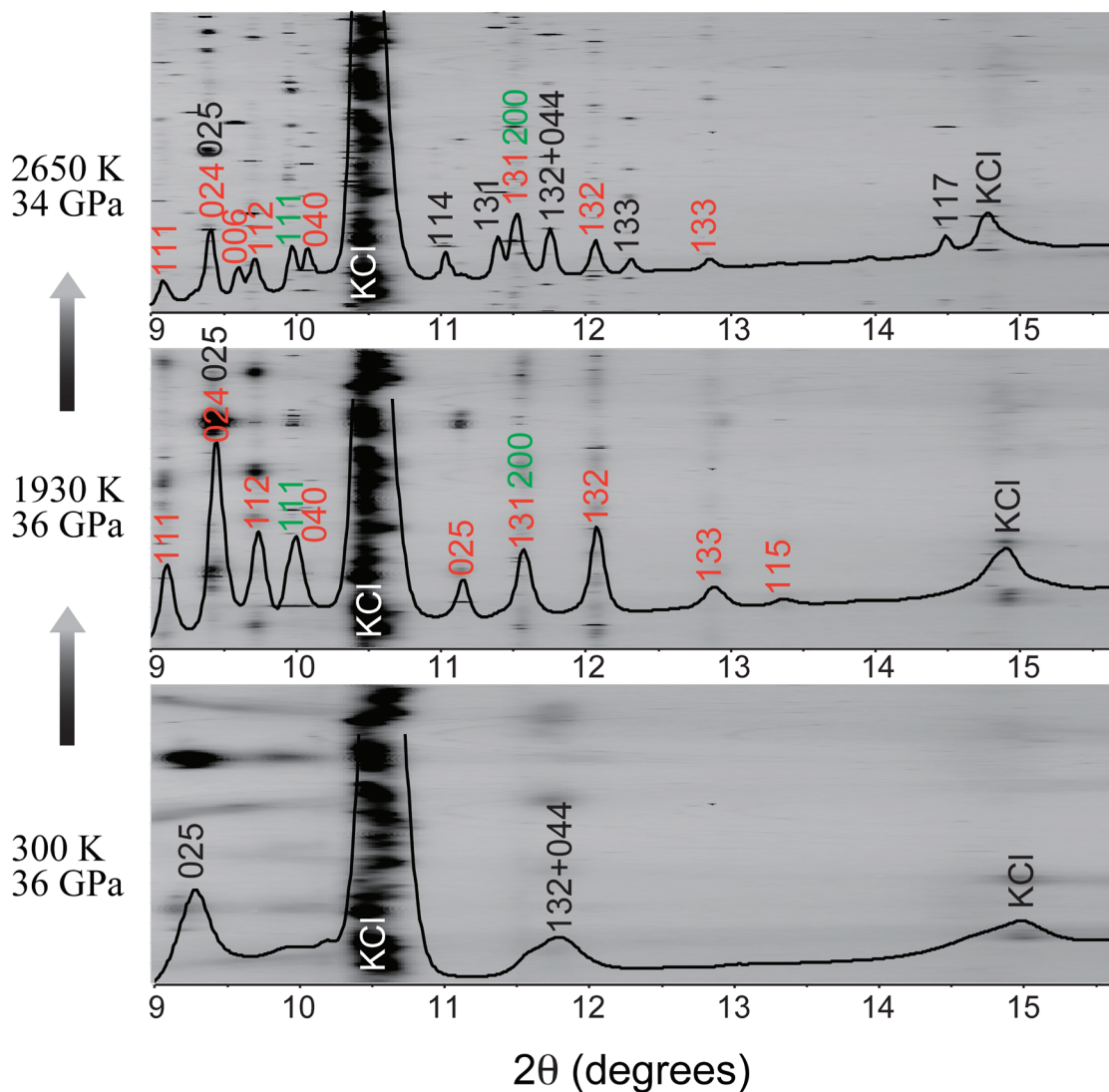


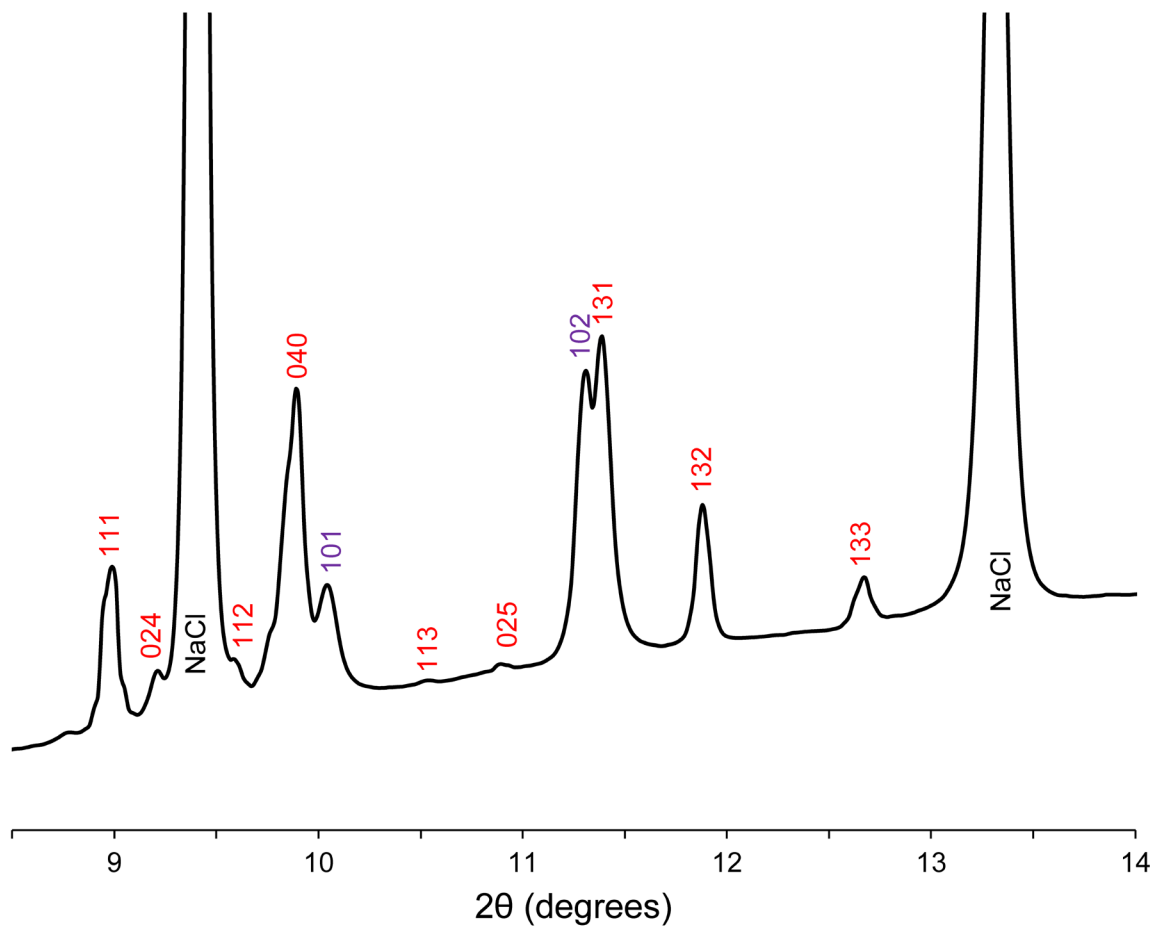
## Supplemental Information



**FIGURE S1.** The Raman spectra from Fe<sub>5</sub>O<sub>6</sub> collected at ambient pressure (black), 19 GPa (dark grey), and 27 GPa (light gray).



**FIGURE S2.** The caked 2D XRD images aligned with integrated 1D patterns shown in Figure 2a. The color of labels: black = Fe<sub>5</sub>O<sub>6</sub>, red = Fe<sub>4</sub>O<sub>5</sub>, and green = FeO. Peak positions moved to some extent upon heating because of the release of large deviatoric stress at 300 K.



**FIGURE S3.** The typical XRD pattern of rhombohedral FeO (purple) + Fe<sub>4</sub>O<sub>5</sub> (red) at 19 GPa and 300 K after heating in run #3.

**TABLE S1.** Unit-cell volume of Fe<sub>4</sub>O<sub>5</sub> at high pressures and 300 K

Run #	Pressure medium	<i>P</i> (GPa)	<i>a</i>	<i>b</i>	<i>c</i>	<i>V</i> (Å <sup>3</sup> )	hkl of peaks used
1	NaCl	33.66(11)	2.765(3)	9.455(18)	11.951(44)	312.5(25)	111, 112, 113, 131, 132, 133
2	NaCl	22.53(10)	2.798(3)	9.530(11)	12.157(13)	324.1(10)	111, 024, 040, 113, 132, 133
3	NaCl	18.94(4)	2.809(1)	9.580(2)	12.198(3)	328.3(2)	024, 112, 040, 131, 132, 133
4	NaCl	13.11(3)	2.834(1)	9.642(1)	12.313(1)	336.4(1)	112, 113, 132, 133, 116
5	NaCl	17.15(10)	2.815(2)	9.592(10)	12.222(8)	329.9(8)	112, 113, 132, 133, 116
6	NaCl	9.95(3)	2.853(2)	9.692(8)	12.381(6)	342.4(6)	112, 132, 133, 116
	NaCl	17.21(2)	2.828(1)	9.660(12)	12.129(32)	331.3(18)	111, 112, 132, 133
	NaCl	22.86(38)	2.804(2)	9.553(9)	12.156(14)	325.6(9)	111, 040, 025, 132, 133, 116
7	NaCl	7.93(2)	2.855(4)	9.706(17)	12.410(6)	343.9(11)	131, 132, 133, 116
8	KCl	35.31(6)	2.764(7)	9.469(49)	11.925(42)	312.2(36)	024, 112, 132, 133
	KCl	46.97(11)	2.731(1)	9.365(8)	11.641(21)	297.7(11)	111, 112, 132, 133
	KCl	61.21(11)	2.686(10)	8.968(53)	11.581(37)	279.0(36)	112, 025, 131, 132, 133
10	KCl	12.23(1)	2.846(5)	9.596(25)	12.304(18)	336.1(19)	112, 132, 133, 116
	KCl	12.04(2)	2.838(2)	9.615(12)	12.295(9)	335.5(9)	112, 132, 133, 115, 134, 116
11	KCl	52.83(22)	2.649(2)	9.353(4)	11.711(5)	290.1(4)	024, 040, 132, 133, 116
12	KCl	39.50(26)	2.744(2)	9.359(10)	11.891(26)	305.4(15)	112, 040, 132, 133, 115
	KCl	53.08(38)	2.680(2)	9.096(4)	11.778(12)	287.1(6)	023, 040, 132, 133
	KCl	56.45(45)	2.669(7)	9.115(23)	11.643(34)	283.2(22)	023, 112, 040, 025, 132, 133

Numbers in parentheses indicate uncertainty in the last digit.