

Supplementary materials to “*Iron-titanium oxyhydroxides as water carriers in the Earth’s deep mantle*” by Y. Nishihara and K.N. Matsukage

#### FIGURE CAPTIONS

Figure S1. Optical photo micrograph of samples recovered from OD1347. Four capsules containing different samples are employed in a single experimental run.

Figure S2. FT-IR spectra of  $\alpha$ -PbO<sub>2</sub> type phase from OD1288-2 obtained by (a) reflection mode and (b) transmission mode. Analysis by transmission mode was conducted with aperture dimension of  $20 \times 20 \mu\text{m}^2$  and 100 scans using 22  $\mu\text{m}$  thick doubly polished thin section. Shape of a peak at  $2858 \text{ cm}^{-1}$  in transmission mode suggests saturation of this peak. Although, in reflection mode spectrum, absorption coefficient is factor of  $\sim 3$  higher than transmission spectrum and peak position shifts systematically to higher wavenumber (by  $5\text{--}15 \text{ cm}^{-1}$ ), most features are quite consistent in these two spectra.

**Table S1. Lattice parameters of  $\alpha$ -PbO<sub>2</sub> type phase and  $\epsilon$ -FeOOH phase**

Phase composition Ti/(Fe + Ti)	Run#	Temperature (°C)	<i>a</i> (Å)	<i>b</i> (Å)	<i>c</i> (Å)
$\alpha$ -PbO <sub>2</sub> type					
0.386	OD1292-4	1000	4.4527(18)	5.7097(16)	5.0552(20)
0.509	OD1288-2	1000	4.4670(18)	5.6802(15)	5.0310(23)
0.757	OD1292-5	1000	4.4866(15)	5.5845(19)	4.9602(19)
0.521	OD1334-2	1400	4.4706(12)	5.6723(13)	5.0307(13)
0.757	OD1336-5	1500	4.4966(2)	5.5972(2)	4.9723(2)
1.000	OD1336-7	1500	4.5345(4)	5.4998(3)	4.9048(3)
$\epsilon$ -FeOOH					
0.002	OD1292-6	1000	4.9394(18)	4.4442(16)	2.9938(10)
0.133	OD1288-1	1000	4.9289(24)	4.4488(35)	2.9978(10)

Figure S1

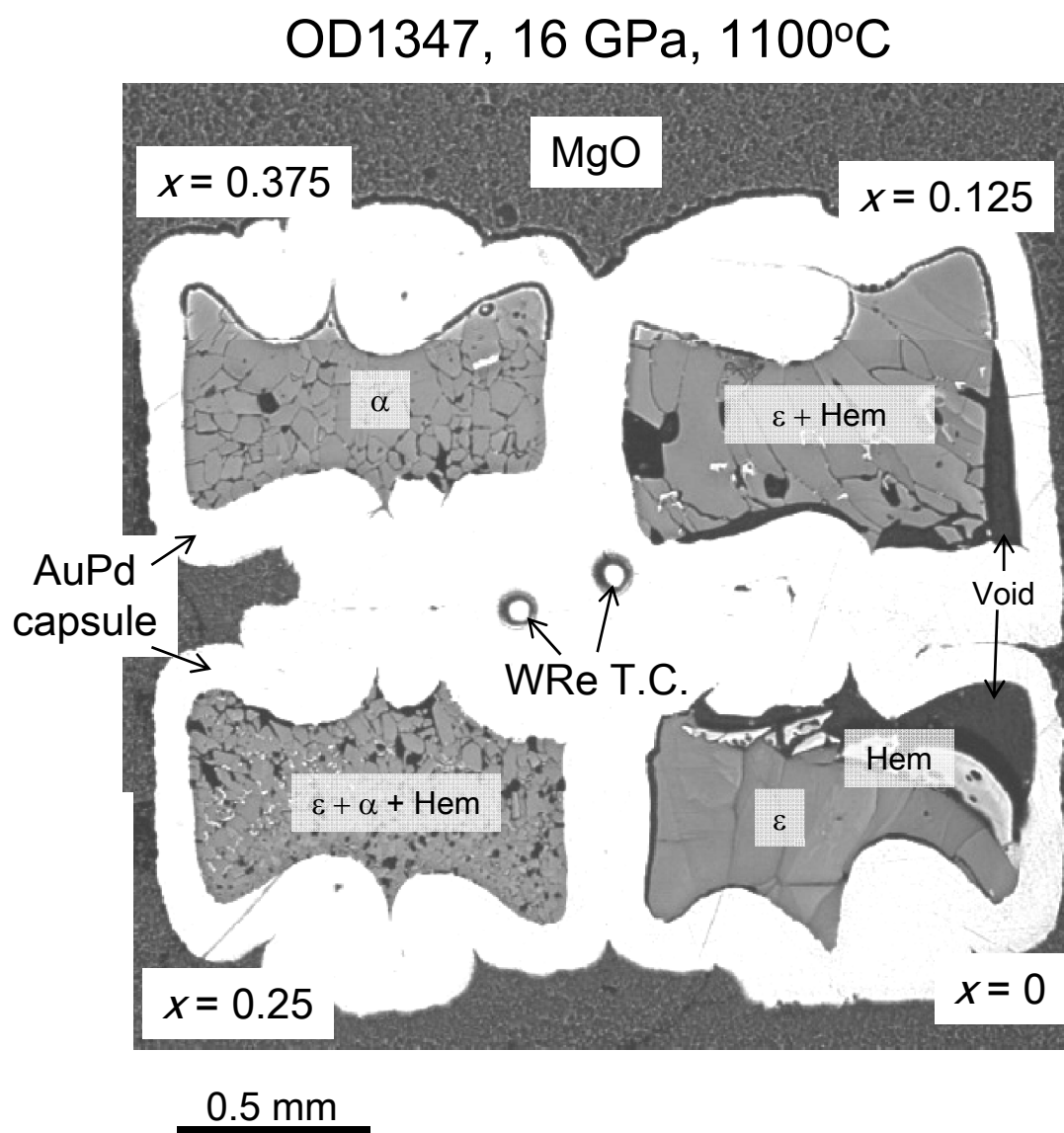


Figure S2

