

## **Supplementary Information**

### **Pressure-induced structural phase transitions in natural kaolinite investigated by Raman spectroscopy and electrical conductivity**

**Meiling Hong <sup>1,3</sup>, Lidong Dai <sup>1,2,\*</sup>, Haiying Hu <sup>1,2,\*</sup>, and Xinyu Zhang <sup>1,3</sup>**

<sup>1</sup> Key Laboratory of High-Temperature and High-Pressure Study of the Earth's  
Interior, Institute of Geochemistry, Chinese Academy of Sciences, Guiyang, Guizhou

550081, China

<sup>2</sup> Shandong Provincial Key Laboratory of Water and Soil Conservation and  
Environmental Protection, College of Resources and Environment, Linyi University,

Linyi, Shandong 276000, China

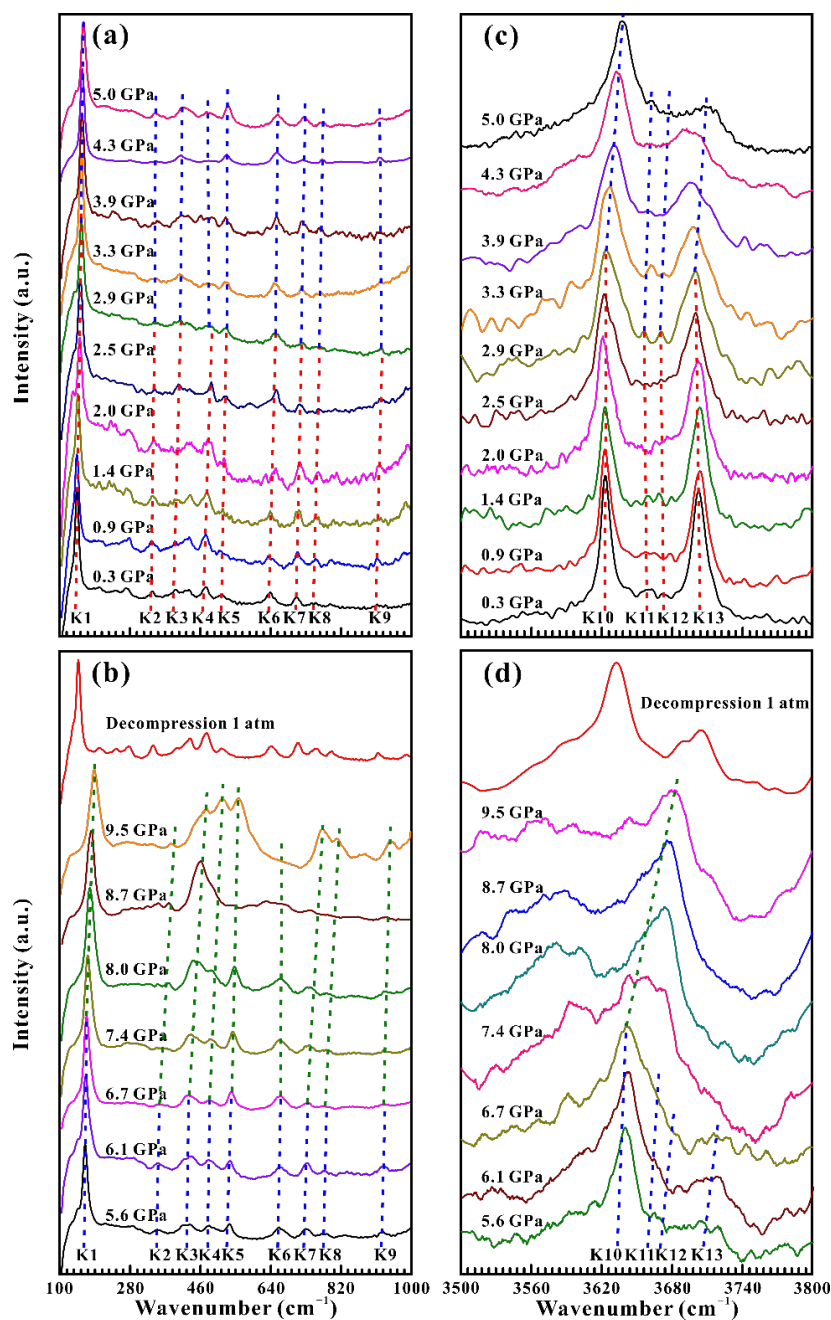
<sup>3</sup> University of Chinese Academy of Sciences, Beijing 100049, China

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\* Authors to whom correspondence should be addressed: [dailidong@vip.gyig.ac.cn](mailto:dailidong@vip.gyig.ac.cn) and [huhaiying@vip.gyig.ac.cn](mailto:huhaiying@vip.gyig.ac.cn)

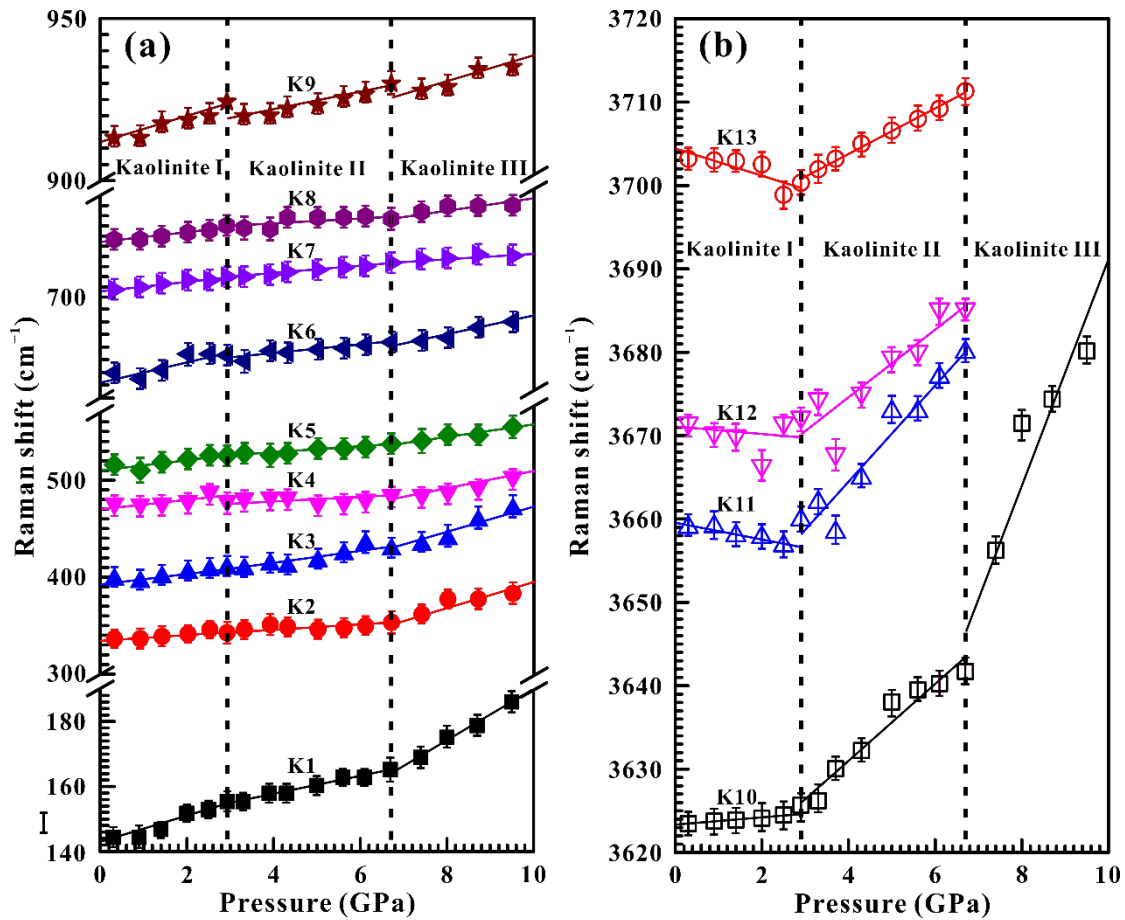
## Supplementary Figures and Table

Figure S1



**Figure S1.** Raman spectra of natural kaolinite at the pressure range of 0.3–9.5 GPa during compression and the Raman spectrum of kaolinite decompression to 1 atm under hydrostatic condition. In here, **(a)** and **(b)** are the lattice vibrational mode (100–1000 cm<sup>-1</sup>), **(c)** and **(d)** represent the hydroxyl stretching mode (3500–3800 cm<sup>-1</sup>), respectively.

Figure S2



**Figure S2.** Pressure dependence the Raman shift with increasing pressure for natural kaolinite under hydrostatic condition. In here, **(a)** stands for the lattice vibrational mode (100–1000 cm<sup>-1</sup>), **(b)** represents the hydroxyl stretching mode (3500–3800 cm<sup>-1</sup>), respectively.

**Table S1.** Pressure dependence of the Raman shift ( $d\omega/dP$ ) ( $\text{cm}^{-1} \text{ GPa}^{-1}$ ) for natural kaolinite under hydrostatic condition. In here,  $\omega$  ( $\text{cm}^{-1}$ ) and  $P$  (GPa) are the Raman shift and pressure, respectively.

Pressure (GPa)	$\omega$ ( $\text{cm}^{-1}$ )	$d\omega/dP$ ( $\text{cm}^{-1} \text{ GPa}^{-1}$ )	$\omega$ ( $\text{cm}^{-1}$ )	$d\omega/dP$ ( $\text{cm}^{-1} \text{ GPa}^{-1}$ )	$\omega$ ( $\text{cm}^{-1}$ )	$d\omega/dP$ ( $\text{cm}^{-1} \text{ GPa}^{-1}$ )
0.3–2.5	144.4 (K1)	4.41	639.5 (K6)	8.99	3659.0 (K11)	−1.03
	336.6 (K2)	4.33	707.4 (K7)	4.61	3671.5 (K12)	−0.71
	397.6 (K3)	5.18	756.6 (K8)	4.49	3703.2 (K13)	−1.63
	475.9 (K4)	4.86	913.2 (K9)	3.41		
	515.9 (K5)	5.50	3623.5 (K10)	0.42		
2.9–6.1	155.4 (K1)	2.60	653.4 (K6)	3.06	3659.9 (K11)	5.77
	342.5 (K2)	1.21	720.0 (K7)	3.53	3672.2 (K12)	4.02
	409.5 (K3)	7.28	770.2 (K8)	3.83	3700.3 (K13)	2.78
	478.3 (K4)	0.60	924.3 (K9)	1.45		
	525.4 (K5)	2.69	3625.7 (K10)	4.66		
6.7–9.5	165.2 (K1)	7.49	663.8 (K6)	6.23	3680.0 (K11)	—
	353.4 (K2)	10.78	733.7 (K7)	2.61	3685.2 (K12)	—
	428.6 (K3)	15.67	777.0 (K8)	4.50	3711.3 (K13)	—
	484.2 (K4)	6.74	929.9 (K9)	2.44		
	537.1 (K5)	5.98	3641.7 (K10)	13.59		