

## Supplementary Information

# High-pressure structural phase transition and metallization in Ga<sub>2</sub>S<sub>3</sub> under non-hydrostatic and hydrostatic conditions up to 36.4 GPa

Linfei Yang,<sup>a‡</sup> Jianjun Jiang,<sup>ba‡</sup> Lidong Dai,<sup>\*ba</sup> Haiying Hu,<sup>\*ba</sup> Meiling Hong,<sup>ac</sup>  
Xinyu Zhang,<sup>ac</sup> Heping Li<sup>a</sup> and Pengfei Liu<sup>d</sup>

<sup>a</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>b</sup> Shandong Provincial Key Laboratory of Water and Soil Conservation and Environmental Protection, College of Resources and Environment Sciences, Linyi University, Linyi 276000, China

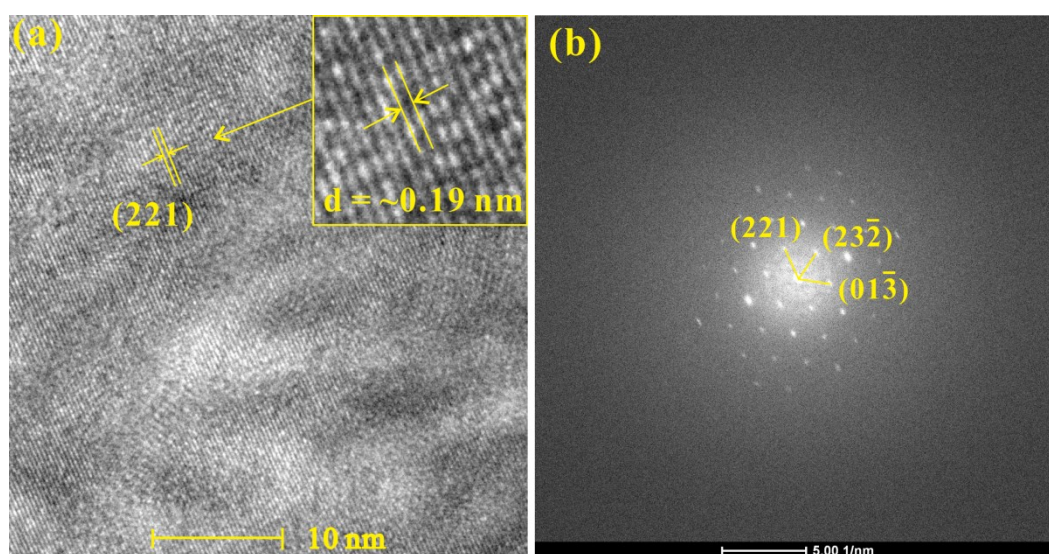
<sup>c</sup> University of Chinese Academy of Sciences, Beijing 100049, China

<sup>d</sup> State Key Laboratory of Structural Chemistry, Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, Fuzhou, Fujian 350002, China

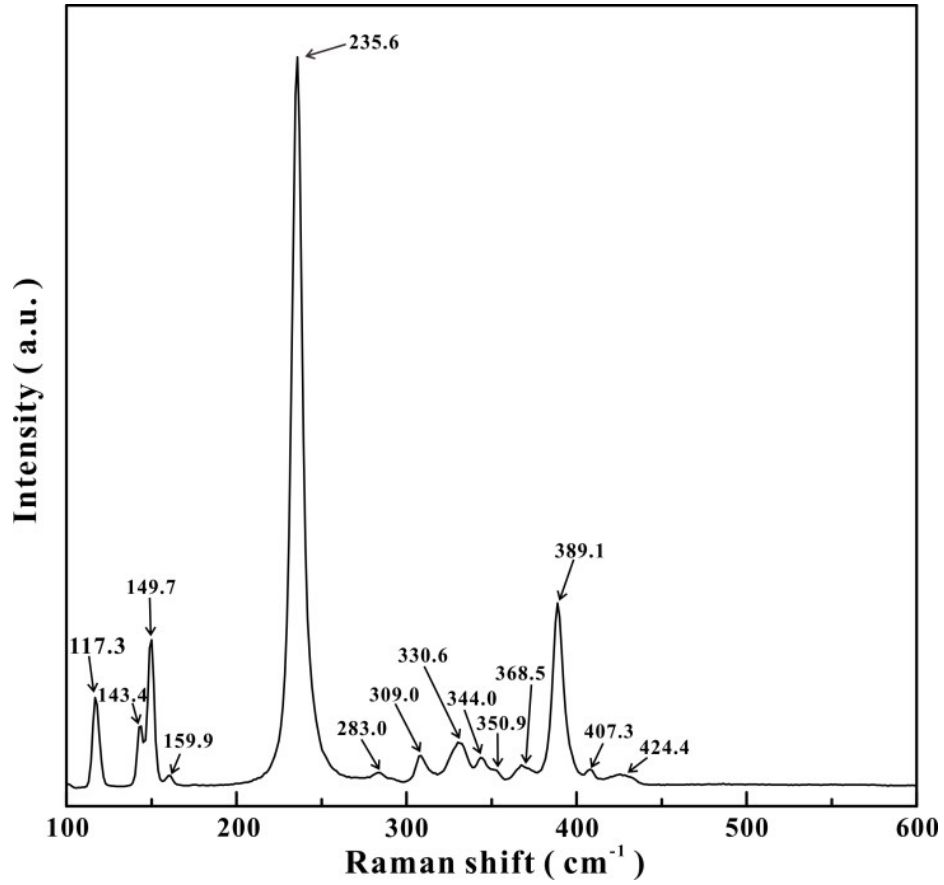
\*Corresponding author. Email address: dailidong@vip.gyig.ac.cn,

huhaiying@mail.gyig.ac.cn.

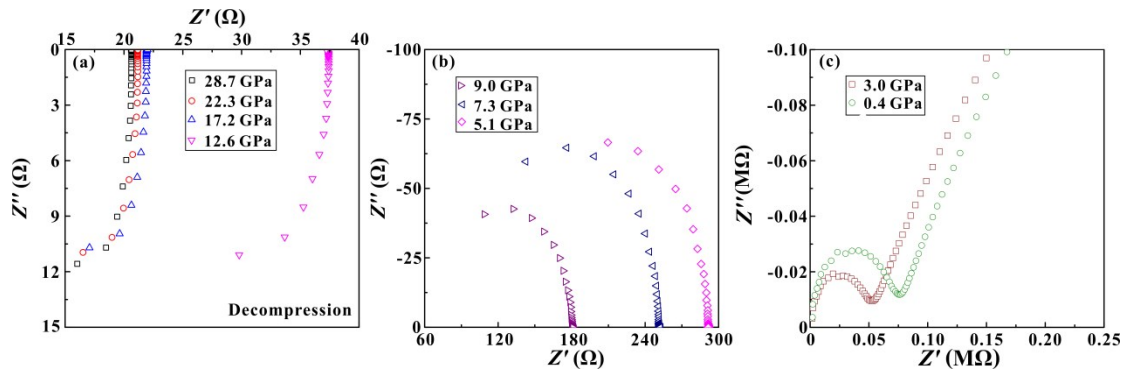
## Supplementary Figures



**Fig. S1** (a) HRTEM image for the initial sample at ambient conditions. (b) The corresponding FFT diagram of the initial sample.



**Fig. S2** The Raman spectra of  $\text{Ga}_2\text{S}_3$  at ambient conditions collected in the region from  $100 \text{ cm}^{-1}$  to  $600 \text{ cm}^{-1}$ .



**Fig. S3** (a)–(c) The impedance spectra of  $\text{Ga}_2\text{S}_3$  at different pressures during the process of decompression.