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## Study of antigorite Crystal Cell Parameters Changing with Temperature and Pressure by TEM

HEN Tingting<sup>1,\*</sup> and CHEN Jing<sup>2</sup>

<sup>1</sup> Center for Advanced Research on the Mantle (CARMA), Key Laboratory of Deep Earth Dynamics of Ministry of Land and Resources, Institute of Geology, Chinese Academy of Geological Sciences, Beijing 100037, China

<sup>2</sup> Electron microscopy laboratory, Peking University, Beijing, 100871, China

### Abstract

To determine the P-T conditions of serpentinite without any specific metamorphic minerals is a difficult work, because the main mineral antigorite could stable at a wide P-T range of about 400-700°C, 10-50 kbar. Observations from natural rocks and high-pressure experiments both suggest that the length of a-axis of antigorite (can calculate as m value) is related to temperature and pressure, which could be used as a thermobarometer. However, some researchers disagree with this point. In this study, transmission electron microscope (TEM) technique is used to measure the crystal structure of antigorite obtained by whole-rock system high pressure experiments, and then compare with the experimental results in the predecessors' MgO-SiO<sub>2</sub>-H<sub>2</sub>O (MSH) system, to find out the correlation between m value of antigorite and P-T conditions in the whole-rock system. According to this study, several conclusions have been drawn: (1) the m value of antigorite is elevated with increasing pressure; (2) the increase content of aluminum in antigorite migrate the m values to high temperature field; (3) as the temperature rises, the m value of antigorite decreases, and the water content increases.

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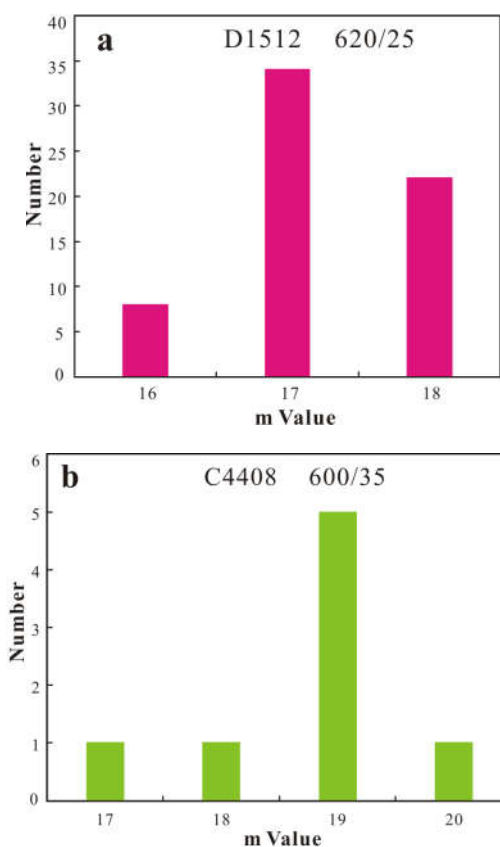


Fig.1 Distribution of a periodicities in terms of m values in antigorite from sample D1512 (a) and C4408 (b)

\* Corresponding author. E-mail: jchen@pku.edu.cn