

Abstract Submitted  
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**A possible existence of phase change of deuterated ice VII at about 11 GPa by X-ray and Raman studies** HISAKO HIRAI, HIROKAZU KADOBAYASHI, Geodynamics Research Center, Ehime University, TAKAHIRO MATSUOKA, KYOKUGEN, Osaka University, YASUO OHISHI, Japan Synchrotron Radiation Research Institute, TAKEHIKO YAGI, Geodynamics Research Center, Ehime University — Ice exhibits a wide variety of forms because of polarity of water molecules. More than fifteen forms including crystalline and amorphous phase have been reported so far. Among them ice VII and ice VIII have been known to have wide stability region, however, recent experimental and theoretical studies have suggested possible phase change and property change at around 10 to 15 GPa. The change has not yet sufficiently been explained. To obtain a clue for understanding the phase change, high pressure experiments were performed with deuterated and light water using DAC at room temperature. Raman spectroscopy showed that the peak width of OD vibrational mode became sharper at about 11 GPa with increasing pressure, and then it became broader again above the pressure. The squared vibrational frequency changed linearly with pressure, and the slope evidently changed at about 14 GPa, indicating existence of phase change. In-situ X-ray diffractometry revealed splitting of diffraction line of cubic ice VII above 11 GPa, which were indexed a tetragonal structure. The similar result was reported previously for light water. The tetragonal structure survived at least up to 60 GPa. All experimental results showed existence of phase change at around 11 GPa.

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