

Abstract Submitted  
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**Pressure Induced Phase Transitions of Cycloheptanone and Cycloheptanol up to 30 GPa**<sup>1</sup> CHUNLI MA, QILIANG CUI, Jilin University, ZHENXIAN LIU, Carnegie Institution of Washington — High-pressure spectroscopic studies of cycloheptanone (C<sub>7</sub>H<sub>12</sub>O) and cycloheptanol (C<sub>7</sub>H<sub>14</sub>O) have been carried out up to 30 GPa at room temperature using Raman scattering and infrared absorption combined with diamond anvil cell techniques. Different phase transition behaviors in these derivatives of cycloheptane have been observed. Both Raman and infrared absorption spectra show dramatic changes at 1 GPa including the appearance of new peaks and peak sharpening/splitting. These changes can be attributed to the phase transition from liquid phase into truly crystalline phase. With further compression, cycloheptanone gradually turns into amorphous state when pressure higher than 24.0 GPa. In contrast, no truly crystalline phase was observed in cycloheptanol up to 30 GPa. A phase transition from liquid to plastic phase was observed around 1.5 GPa based on the synchrotron angle dispersive x-ray diffraction measurements. The cycloheptanol begins to transform into glass phase around 4.0 GPa as all the Raman, infrared and x-ray diffraction peaks start to broadening. The mechanism of very different phase transitions presented in these derivatives of cycloheptane with two different substituent groups has been discussed.

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