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## *Hydrogen-rich Inclusion Compounds at High-pressure*

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Molecular hydrogen ($H_2$) has been proposed as an alternative fuel source for vehicles. Though $H_2$ has many benefits, such as clean combustion and the highest known energy density by mass, there are issues in how to store it in a safe and cost effective way. One solution is to store hydrogen in a chemical compound, and gas clathrates (crystalline inclusion compounds) have shown promising results. Pressure provides a powerful means to tune the properties of such compounds and its effects on potential hydrogen storage materials are widely explored. We have recently developed a hydrogen-compatible gas loader for the Paris-Edinburgh press, which enables the loading of high density hydrogen into a clamp with a sample volume suitable for neutron diffraction experiments using the Paris-Edinburgh press [1]. Neutron diffraction is the technique of choice for such materials since it can reveal the location and occupancy of the hydrogen sites. We will present recent data from high-pressure neutron diffraction experiments on hydrogen hydrates as well as other clathrate forming systems like urea and hydroquinone.

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