



Contribution ID: 6

Type: **not specified**

Use of Neutron Diffraction for the Characterization of Metal Hydrides

Thursday, 6 June 2024 09:40 (20 minutes)

For the development of hydrogen as an energy carrier efficient ways to store hydrogen should be implemented. Beside storage in pressure tanks and in liquid form, an effective way to store hydrogen is in metal hydrides. Metal hydrides are attractive for storing hydrogen because they have high volumetric capacities, low operational pressure, and could be used for any scale of applications. In order to design metal hydrides that will match the operational conditions, a fundamental understanding of hydrogen-metal interaction is needed. Practically the only way to probe hydrogen in the crystal structure of a metal hydride is by using neutrons. In this talk we will present a few examples of using neutrons to get a better knowledge of a metal hydride. First, we will show that one can use the different scattering lengths of deuterium and hydrogen to study the dynamic of hydrogenation in the Mg-Fe system. The second example will be the phase transformation of BCC to FCC in a Ti-V-Mn alloys. Here, we used that fact that the BCC alloy is effectively a null matrix and the appearance of the hydride phase is very easy to identify during in-situ experiments. We will conclude the talk with a short discussion of other ways to use neutrons to characterize metal hydrides.

Primary author: HUOT, Jacques (Université du Québec à Trois-Rivières (UQTR))

Presenter: HUOT, Jacques (Université du Québec à Trois-Rivières (UQTR))