

### Hydrogen storage in Li inserted Alumina nanotube

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Soaring oil price everyday instigates human to develop a new alternative energy. Hydrogen energy is focused on the most feasible energy for future due to no emission of pollutants, high efficiency and infinitive amount. But hydrogen has very low density and low explosion energy so that it is difficult to store in high-pressure tank like any other gas. The hydrogen plan of Department of Energy of the United States (DOE) requires system weight efficiency of 6.5wt% and volumetric density of 62kg H<sub>2</sub>/m<sup>3</sup>. This study is to develop the materials to store hydrogen for meeting the goals of DOE. We used Li inserted Postech Alumina Nanotube (Li-PANT). Li-PANT is synthesized by adding controlled amount of water in the mixture of Aluminum tri-sec butoxide as alumina precursor and Cetytrimethylammonium bromide(CTMABr) as structure template adding LiOH in-situ. And the stored amount of hydrogen in Li-PANT is measured as increasing pressure up to 40 bar step by step at constant temperature (RT, 200°C) with volumetric adsorption/Desorption apparatus (Sieverts' apparatus from Hy-energy LLC).