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BOOK OF ABSTRACTS



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a prerequisite for the use of hydrogen problem of hydrogen prevents its wide use the available techniques, storage in recommended and it has wide industrial developed, including recharged batteries, Modeling of experimental isotherm of 1 used to get information for calculation energy and surface area of adsorption. The relation to the hydrogen charging properties. A new analytical isotherm equation similar to BET equation but modified, is developed using the grand canonical ensemble in statistical physics. The establishment of the expression model is based on a statistical physics treatment and some working hypotheses.

We mainly introduce four parameters affecting the adsorption process, namely, the density of hydrogen receptor sites N_m , the number of molecules per site and the hydrogen adsorption energy. The test of the validity of the model describing the adsorbed quantity of hydrogen on $\text{LaNi}_{4.75}\text{Fe}_{0.25}$ alloy by fitting the experimental data has been done using numerical simulation and a reasonable agreement is obtained.

NOVEL CONCEPTION MATERIALS BASED ON POLYMERIC MATRIX FOR H₂ STORAGE 3A5

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Abstract

One of the great drawback to the widespread use of hydrogen as a nonpolluting fuel for automotive is the lack of a safe and efficient system for on-board storage. The most investigated approaches include hydrogen storage as a liquid at low temperatures, as a gaseous H₂ at high pressures or as an atomic hydrogen in a metal hydride. Each of these methods presents a high potentiality even if different engineering problems have been reported. Actually, the interest has been addressed towards the use of the micro porous material able to work under moderate pressure and cryogenic temperature. Some of them such as activated carbons and zeolites as well as the more recently developed metal-organic frameworks (MOFs) have been

applications. Storage metal hydride is have recently been ing systems. $\text{Ni}_{4.75}\text{Fe}_{0.25}$ alloy is exists such as the

investigated for this application. The organic materials, such as polymers, may offer a significant advantage due to their composition based on light elements [1-3]. However, it is only very recently the polymers have been evaluated as materials for H₂ storage[4]. In this work, a Poly(ether ether ketone) (PEEK) was chosen as a base polymeric matrix with the aim of producing a low cost and weight hydrogen storage material. The polymer acts as a support for the insertion/anchoring of a manganese oxide, through a substitution in situ reaction between the chloride of the chlorine-sulphonic group of the PEEK and potassium permanganate used to produce the above mentioned oxide. A preliminary hydrogen sorption test on synthesized material, using gravimetric measurements had supplied encouraging results (0.3wt% at 50°C and 80bar) about the capability of this composite polymer to store H₂. Further studies on the influence of the reaction parameters have demonstrate the close connection between the obtained products and their ability to adsorb/desorb H₂ in a reversible way even if in non-drastric conditions ($T < 100^\circ\text{C}$ e $P < 60\text{bar}$). Very promising results have been obtained with a polymer containing 78wt% manganese oxide, reaching a value of about 1wt%. The composite polymer was characterized by Scanning Electron Microscopy, X-ray diffraction, Transmission Electron Microscopy and H₂ sorption measurements by Sievert apparatus.

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SOL-GEL PREPARATION OF Co-B₂O₃ CATALYST FOR ALKALINE NaBH₄ HYDROLYSIS 3A6

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