

Hydrogen storage properties of micro-balls and flower shaped zinc oxide

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Here we are presenting the hydrogen storage properties of zinc oxide micro-balls and flowers synthesized by the solution methods at a very low temperature about 70°C in 12 hrs at pH 12.6 by using zinc acetate dihydrate, sodium hydroxide and capping molecule hydroxylamine hydrochloride (NH₂OH.HCl). We noticed that when the concentration of hydroxylamine hydrochloride varies from 0.9M, 1M and 1.5M the morphology of micro balls changes to the flower shaped structure and at the same time the hydrogen absorption is decreases from 1.21 to 0.97 weight%. The morphological characterizations were carried out by using FESEM and transmission electron microscopy and it reveals that the size of individual microballs and flowers are about 3-4µm in diameter. The compositional properties of the powder sample were characterized by the IR spectroscopy and show the characteristic peak of zinc oxide at 423cm⁻¹ and UV-vis absorption spectroscopy presents the standard peak of zinc oxide at 375nm.