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Preparation of Zn Nano-particles and Application in Hydrogen Production

Abstract: The Zn nano-particles prepared by vibration mill were used as one reactant, then let Ar carried the other reactant-water vapour in while the Zn nano-particles was heated. Once the vapour contacted with heated Zn nano-particles, the water-splitting reaction started, hydrogen yielded and solid zinc oxide nanostructures gained. The hydrogen yield rate was tested by GC, finally the solid production was detected by EDS and TEM. It proved that the Zn nano-particles milled for 11 h acted well while contacted with water vapor, and the hydrogen yield rate could reach to a high level of 184 mL/min. TEM images showed a great dispersivity featuring nano-rods intermixed with nano-flakes. These zinc oxide hybrid nano-structures showed a great absorbency comparing with bought ZnO nano-particles and milled Zn nano-particles, especially in visible light with the wave length over 400nm.

Key words: zinc; nano-particles; water-splitting reaction; laser particle size analyzer; particle size analyzer; aimsizer; as-2011 micron laser particle size analyzer; as-2012 submicron laser particle size analyzer

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By Chen Xingjian, Ding Haoran, Xu Bo, Wang Shuilin

(School of Energy and Power Engineering; School of Materials Science and Engineering, University of Shanghai for Science and Technology, Shanghai 200093, China)