

USE OF POWDERS AND COMPOSITES BASED  
ON POROUS AND CRYSTALLINE SILICON  
IN THE HYDROGEN POWER INDUSTRY

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S u m m a r y

Crystalline silicon powders, porous silicon (PS) fractions, and composites based on PS and Pd are studied from the viewpoint of their use as solid-state hydrogen sources. The H<sub>2</sub> release was initiated by H<sub>2</sub>O:C<sub>2</sub>H<sub>5</sub>OH:NH<sub>3</sub> solutions. A comparative analysis of these materials with respect to the total yield of H<sub>2</sub> (i.e. total energy store) and the rate of its release (i.e. power) is performed. It is determined that the most effective material for such applications is A PS powder produced according to the electrochemical technology. It is shown that the treatment of PS and composites with gaseous H<sub>2</sub> insignificantly influences the release of hydrogen from these materials. The effect of the NH<sub>3</sub> concentration, temperature, and illumination on the kinetics of H<sub>2</sub> release is studied.