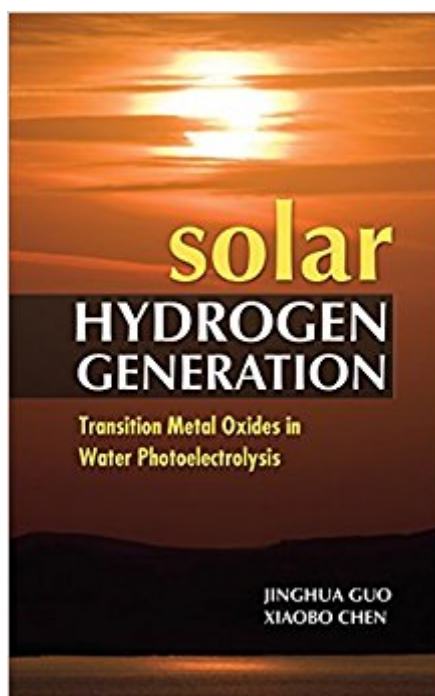




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Solar Hydrogen Generation: Transition Metal Oxides In Water Photoelectrolysis



Synopsis

State-of-the-art renewable energy science research and applications Solar Hydrogen Generation: Transition Metal Oxides in Water Photoelectrolysis provides expert techniques for extracting hydrogen from water using transition metal oxides as catalysts. The basic processes of electrochemistry and photocatalysis for hydrogen production are described along with photocatalytic reactions and semiconductor photocatalysts, particularly metal oxides. This in-depth guide illustrates the corresponding crystal structure vs. electronic structure and optical properties vs. light absorption of transition metal oxides. Impurity and doped photocatalysts, integrated organic and inorganic systems, surface and interface chemistry, and nanostructure and morphology in photocatalysis applications are all addressed. This comprehensive resource introduces soft x-ray absorption (XAS), soft x-ray emission spectroscopy (XES), and resonant inelastic soft x-ray scattering (RIXS), followed by a description of instrumentation. **COVERAGE INCLUDES:** * Hydrogen generation: electrochemistry and photoelectrolysis * Photocatalytic reactions, oxidation, and reduction * Transition metal oxides * Crystal structure and electronic structure * Optical properties and light absorption * Impurity, dopants, and defects * Surface and morphology * Soft x-ray spectroscopy and electronic structure

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