1. Record Nr. UNINA9910799215103321

Titolo	Solar Light-to-Hydrogenated Organic Conversion : Heterogeneous Photocatalysts / / edited by Hairus Abdullah
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2024
ISBN	981-9981-14-X
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (XI, 292 p. 194 illus., 145 illus. in color.)
Disciplina	541.395
Soggetti	Heterogeneous catalysis Materials Catalysis Nanoscience Photocatalysis Heterogeneneous Catalysis Nanophysics Metal-organic Frameworks
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Chapter 1 Photocatalytic reduction of nitrophenol and nitrobenzene with Zn oxysulfide semiconductor without using reducing agents -- Chapter 2 Photoreactions on hydrogen production and cleavage of azo bond in azobenzene over metal oxide and sulfide nanocatalysts in a mild condition -- Chapter 3 Photocatalytic oxygen reduction reaction to generate H2O2 over carbon-based nanosheet catalysts -- Chapter 4 Photocatalytic glycerol valorization into valuable chemicals and hydrogen generation on nanocatalysts -- Chapter 5 Photocatalysis on selective hydroxylation of benzene to phenol.
Sommario/riassunto	This book highlights the promising photocatalytic methods for synthesizing organic chemicals by simultaneously degrading the toxicity of raw substances used for organic synthesis. It presents various semiconducting materials with high catalytic activities in hydrogen evolution reactions (HERs) and hydrogenation reactions, as well as the material characterizations for identifying semiconductor photocatalysts. The focus is on understanding the hydrogen

dissociation and activation of substances in the process of hydrogenation and the fabrication of nanostructured catalysts with desired activity and selectivity. Recent works show photocatalytic hydrogenation reactions with in situ generated H+ on catalyst surfaces utilizing initial chemicals such as nitrophenol, nitrobenzene, azobenzene, and benzene for valorization. In addition, the photocatalytic valorization of waste glycerol is also discussed. Besides the hydrogenation reactions, the reduction of oxygen to form H2O2 can be done with aphotocatalytic method in atmospheric conditions. Some related perspectives and outlooks are also discussed for possible future development.