

## Hydrogen evolution from ZnO/CuO-Cu<sub>2</sub>O heterostructure photocatalyst

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Owing to consumption of limited fuels and environmental problems, development of eco-friendly energy production is needed. In this situation, hydrogen energy attracts much interest, and related technologies are being developed. One of the hydrogen production methods is the solar water splitting using photocatalysts. Hydrogen is produced by water splitting. In this study, zinc oxide, cupric and cuprous oxides are served as photocatalyst materials. The photocatalyst fabricated by varying compositions were characterized using several method. Many analytical methods such as SEM, TEM, XPS, XRD, UV-vis, and Raman are used, and Hydrogen production rate and repeatability rate were also measured by gas chromatography under continuous solar irradiation