

Design of Metal Oxide Nanostructured Materials for Enhanced Photocatalytic Energy & Environmental Sustainability

Ghim Wei Ho

Engineering Science Programme, National University of Singapore, 9 Engineering Drive 1, 117576, Singapore

*Department of Electrical and Computer Engineering, National University of Singapore, 4 Engineering Drive 3, 117576, Singapore
elehgw@nus.edu.sg*

Global energy consumption increased dramatically over the years, driven by rising standards of living and a growing worldwide population. The increased demand for energy will require significant growth in energy generation capacity, secure energy sources, and a zero carbon emissions motivations. Among the various alternative energy strategies, the production of chemical fuels by solar energy conversion has been considered as one of the major strategies for solving the global energy issues. In our work, various metal oxide nanostructured materials nanocomposite were synthesized.¹⁻⁶ Our findings emphasize on the achievement of tailoring chemical composition, structural design (core-shell, hierarchical structures) and functionalizing to enable improved solar hydrogen production and degradation properties. Notably, the synergistic morphology, interface and crystal lattice engineering aim towards the design of improved catalyst materials and system for photocatalytic solar hydrogen production and pollutant degradation.

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