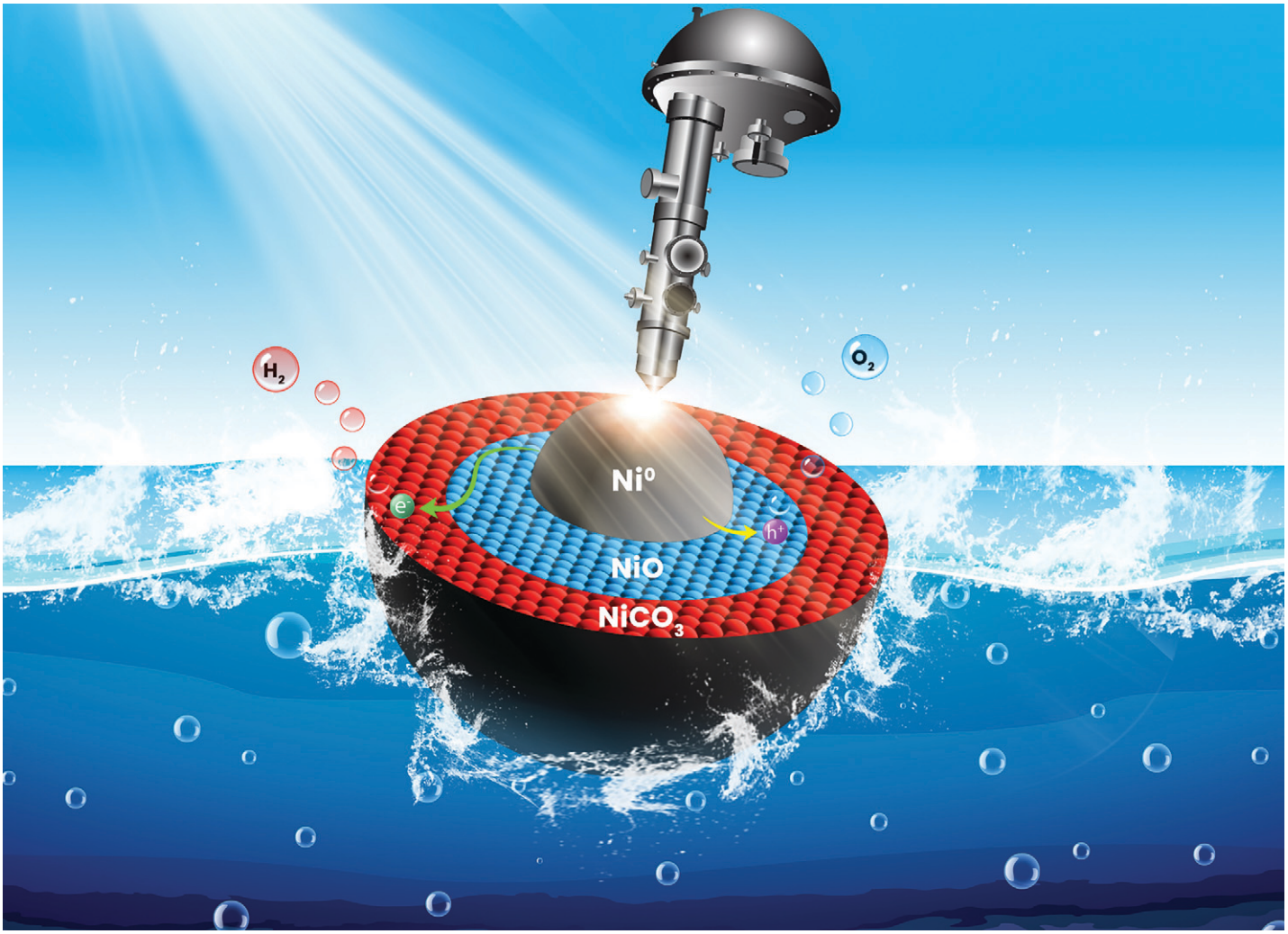

Showcasing research from Nano and Molecular Systems Research Unit, Faculty of Science, University of Oulu, Finland.

Solar light driven atomic and electronic transformations in a plasmonic Ni@NiO/$NiCO_3$ photocatalyst revealed by ambient pressure X-ray photoelectron spectroscopy

This study employs APXPS to explore electronic and atomic transformations in a core-shell Ni@NiO/$NiCO_3$ plasmonic photocatalyst for the hydrogen evolution reaction (HER) under in situ conditions. The catalyst undergoes reversible structural and electronic modifications under water vapor and solar simulator light. Light absorption by the metallic Ni core induces the generation of hot electrons which are utilized for HER on $NiCO_3$. Concurrently, holes migrate to NiO, leading to reversible oxidation to NiOOH. This investigation also elucidates carbonate's role in photocatalysis, providing valuable insights into this aspect of photocatalysis.

As featured in:

See Manoj Kumar Ghosalya, Harishchandra Singh, Samuli Urpelainen *et al.*, *Catal. Sci. Technol.*, 2024, **14**, 3029.

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