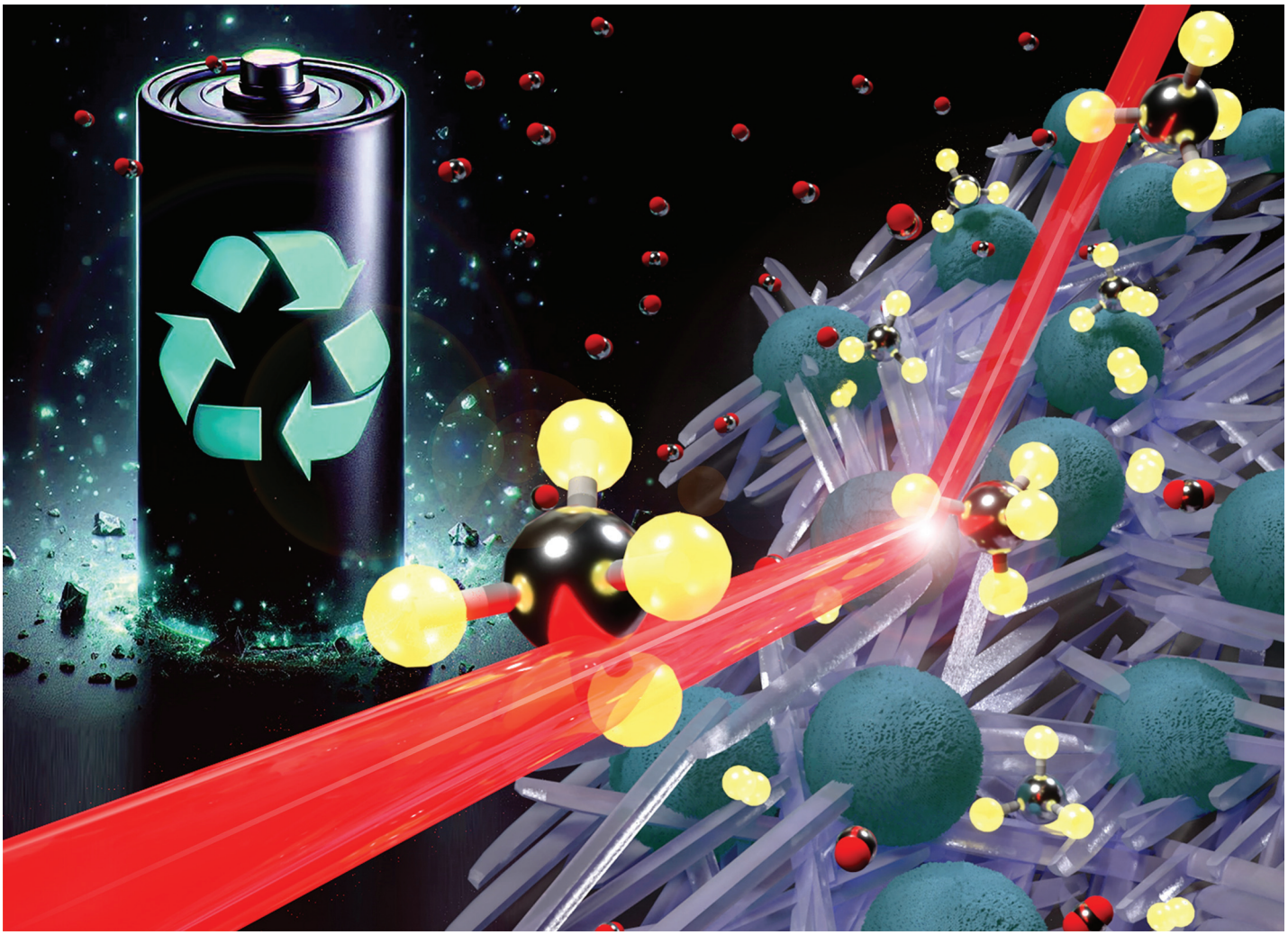


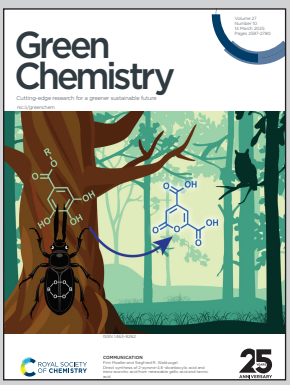
Showcasing research from Professor Günther Rupprechter's laboratory, Institute of Materials Chemistry, TU Wien, Austria.

Upcycling hazardous waste into high-performance Ni/η-Al_2O_3 catalysts for CO_2 methanation

This study upcycles hazardous waste, specifically spent Ni-MH batteries and aluminum foil, into high-performance Ni/η-Al_2O_3 nanocatalysts for CO_2 hydrogenation, promoting circular economy and resource efficiency. The waste-upcycled Ni/η-Al_2O_3 demonstrates exceptional performance, achieving 99.8% CH_4 selectivity and a remarkable space-time yield of 80.3 $mmol_{CH_4}$ g_{cat}^{-1}, h^{-1} at 400°C. This breakthrough enables sustainable and efficient conversion of CO_2 into synthetic fuel, addressing both environmental and green energy challenges. The spent catalyst is recycled into precursors, closing the loop.

Image reproduced by permission of Günther Rupprechter from *Green Chem.*, 2025, **27**, 2706.

As featured in:



See Gunther Rupprechter *et al.*, *Green Chem.*, 2025, **27**, 2706.

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