

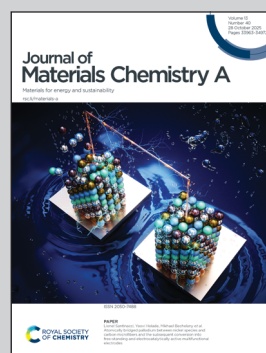
Showcasing research from Dr Emilia Olsson's group at University of Amsterdam and the Advanced Research Center for Nanolithography, and Dr Jörg Meyer's group at Leiden University.

Forged by charge: polaron-induced matrix formation in silicon nitride conversion-type anodes for lithium-ion batteries

The quest for high-capacity anodes is vital for next-generation Li-ion batteries. Amorphous silicon nitride ($a\text{-Si}_3\text{N}_4$) has emerged as a promising conversion-type anode where Li incorporation drives the formation of a structurally robust matrix and active phases. Here, we demonstrate that charge trapping, driven by polaron and bipolaron formation, governs the initial transformation of $a\text{-Si}_3\text{N}_4$ towards active Si-rich regions accompanied by a Li-Si-N matrix that stabilises the anode network.

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As featured in:



See Emilia Olsson *et al.*,
J. Mater. Chem. A, 2025, **13**, 34260.