

Edwin Otten
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Molecular Energy Materials
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Research interests

Research in the Otten group is positioned at the interface between molecular synthesis, physical (in)organic chemistry, and electrochemistry. A core expertise is the synthesis and characterization of air-sensitive compounds, such as organometallic catalysts and high-energy species involved in energy storage (e.g., batteries).

We focus on the development of strategies to replace scarce metal elements by non-critical alternatives. In catalysis, we make use of reactive ligands to augment metal-centered processes, including electron-transfer and substrate activation. Taking the reactivity of molecular complexes with these 'non-innocent' ligands as a starting point, we aim to develop new chemical transformations and study their mechanism.

A second line of research in the Otten group relates to molecular materials for energy storage applications, for example in redox flow batteries. The majority of current battery technologies rely on the use of scarce transition metals ions for charge storage. We design and synthesize new redox-active organics as alternatives charge-storage materials in battery applications. Specifically, my research in this area focuses on understanding the molecular processes that are involved in capacity fade, to improve the lifetime of organic batteries.

Employment

Hoogleraar
Professor
Molecular Energy Materials
University of Groningen
Groningen, Netherlands
13-Nov-2023 → present