Chemists produce new oxidants as a tool for preparative chemistry

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Chemical oxidation, the selective removal of electrons from a substrate, represents one of the most important transformations in chemistry. However, most common oxidants often show disadvantages such as undesired side reactions. The chemist Marcel Schorpp and colleagues from the group of Prof. Dr. Ingo Krossing from the Institute of Inorganic and Analytical Chemistry at the University of Freiburg have successfully generated a novel and extremely stable perfluorinated radical cation. In cooperation with Stephan Rein from the group of Prof. Dr. Stefan Weber from the Institute of Physical Chemistry, this radical was characterized in detail. The researchers recently published their results in the journal *Angewandte Chemie*.

The new reagent proves to be an extremely strong oxidizing agent and allows for the synthesis of reactive species in standard laboratory solvents that were previously difficult or inaccessible—for example, the

oxidation of decamethylferrocenium, which is a long known and very stable species to the corresponding highly reactive dication in the presence of carbon monoxide. With this newly described reagent, many of the above mentioned disadvantages of other oxidants can be circumvented, since it reacts as an innocent oxidizing agent: only taking up electrons from the substrate without showing further reactivity.

Due to the broad applicability described in the article, this reagent is interesting for inorganic, organic chemistry as well as electrochemical or materials science research questions. "In the future, for example, it might be possible to embed it in a polymer to be used as cathode material for organic batteries," explains Schorpp.

More information: Marcel Schorpp et al. Synthesis and Application of a Perfluorinated Ammoniumyl Radical Cation as a Very Strong Deelectronator, *Angewandte Chemie* (2020). DOI: 10.1002/ange.202002768

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