

Electroreductive desulfurative transformations with thioethers

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Thioethers are highly prevalent functional groups in organic compounds of natural and synthetic origin but remain remarkably underexplored as starting materials in desulfurative transformations. As such, new synthetic methods are highly desirable to unlock the potential of the compound class and electrochemistry is an ideal tool to enable new reactivity and selectivity under mild conditions.

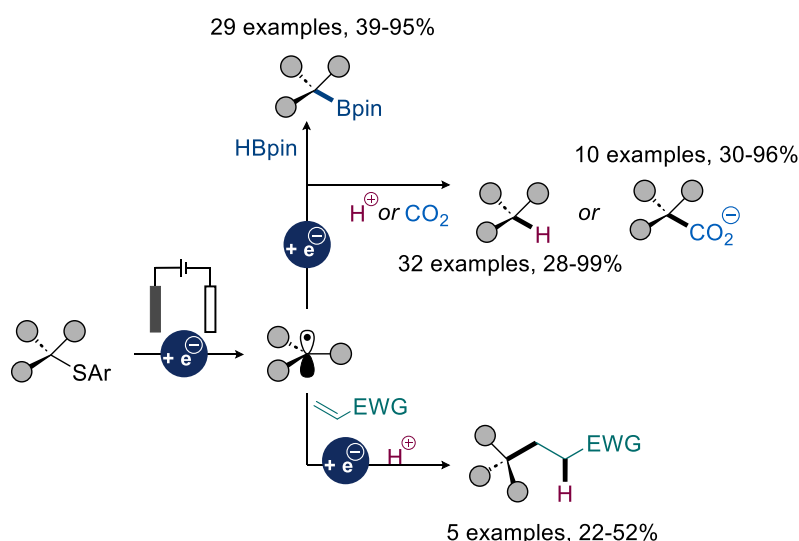


Figure 1. General scheme for electrochemical desulfurative transformation developed.

We demonstrate the efficient use of aryl alkyl thioethers as alkyl radical precursors in electroreductive transformations. The transformations proceed with complete selectivity for C(sp³)-S bond cleavage, providing an orthogonal approach to established transition metal-catalyzed two-electron routes. We showcase a hydrodesulfurization protocol with broad functional group tolerance, the first example of desulfurative C(sp³)-C(sp³) bond formation in Giese-type cross-coupling and the first protocol for electrocarboxylation of synthetic relevance with thioethers as starting materials. Additionally, we show that thioethers outcompete their well-established sulfone analogues as alkyl radical precursors, highlighting their potential for future desulfurative transformations within a one-electron

[1] J. Kuzmin, J. Röckl, N. Schwarz, J. Djossou, G. Ahumada, M. Ahlquist, H. Lundberg, *Angew. Chem. Int. Ed.* **2023**, 62, e202304272.

[2] J. Kuzmin, H. Lundberg, **2024**, DOI 10.26434/chemrxiv-2024-9r9hl.