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S-(Trifluoromethyl)Benzothioate (TFBT): A KF-Based Reagent for Nucleophilic Trifluoromethylthiolation


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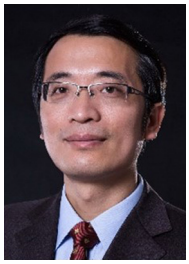
Jinbo Hu

Invited for the cover of this issue is Jinbo Hu and co-workers at Shanghai Institute of Organic Chemistry and Chongqing University. The image depicts TFBT (*S*-(trifluoromethyl) benzothioate), which is easily synthesized using KF, as an inexpensive, bench-stable and user-friendly trifluoromethylthiolation reagent. Read the full text of the article at 10.1002/chem.202104395.

What was the inspiration for this cover design?

Considering that our work features the transformation from inexpensive and readily available inorganic fluorine compound KF to much more valuable organic fluorine compound TFBT, we were quickly inspired by a famous Chinese myth "carp leaps over the Dragon Gate" during the design of this cover art. The cover was designed to describe a transformation process that a carp (representing KF) overcomes difficulties and leaps over the divine gate to become a Chinese dragon (representing TFBT).

What was the biggest challenge (on the way to the results presented in this paper)?

Through controlling the reaction temperature and adding the crown ether, we successfully captured the unstable SCF_3^- anion species (from $S{=}CCl_2$ and KF) and transformed the anion into a stable trifluoromethylthiolation reagent TFBT.

What future opportunities do you see (in the light of the results presented in this paper)?

On one hand, TFBT, as a KF-based trifluoromethylthiolation reagent, promises to find more synthetic applications in life science and materials science-related fields. On the other hand, this research may inspire more research work along the line of synthesizing valuable organic fluorine compounds using readily available and safe inorganic fluorine sources such as KF.

What other topics are you working on at the moment?

We are working on the development of practically useful reagents and reactions by understanding the unique "fluorine effects" in chemical reactions, and on the synthesis of fluorinated compounds and materials possessing both unique structures and functions.