## Key words

trifluoromethylthiolation
$\beta$-keto esters
quinine
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Enantioselective Electrophilic Trifluoromethylthiolation of $\beta$-Ketoesters: A Case of Reactivity and Selectivity Bias for Organocatalysis
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## Organocatalytic Trifluoromethylthiolation of $\beta$-Keto Esters







$$
\text { er from 60:40 to } 98: 2
$$

89



Selected examples:

$90 \%$ yield, er = 96:4

$93 \%$ yield, er = 90:10

Reaction pathway:

$88 \%$ yield, er $=98: 2$

Significance: A highly enantioselective trifluoromethylthiolation of $\beta$-keto esters is reported by Shen and co-workers. The reaction is catalyzed by quinine $\mathbf{1}$ or the quinine-derived phase-transfer catalyst 2. Good to excellent yields and enantioselectivities are obtained by utilizing different catalysts for different ring sizes of the $\beta$-keto esters. The free hydroxyl group of the catalyst is crucial for reactivity, and the $\mathrm{SCF}_{3}$-substituted quaternary ammonium pathway was ruled out by control experiments. The proposed reaction pathway involves a dual activation, in which the catalyst activates both the $\beta$-keto ester and the $\mathrm{SCF}_{3}$ reagent via a double hydrogen bonding.
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Comment: The introduction of fluorine functional groups into different molecules is of great importance for the pharmaceutical and agrochemical industries. Here, the authors report a practical procedure for highly enantioselective trifluoromethylthiolation of $\beta$-keto esters. This methodology provides a straightforward way to build quaternary carbon centers with a $\mathrm{SCF}_{3}$ group, which potentially could lead to useful drug candidates. At the same time, Rueping and co-workers report a very similar study, but utilizing different $\mathrm{SCF}_{3}$ sources (T. Bootwicha, X. Liu, R. Pluta, I. Atodiresei, M. Rueping Angew. Chem. Int. Ed. 2013, 52, 12856).

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