

PHOTOELECTROCATALYTIC ARENE C–H AMINATION

Lei Zhang, Laurent Liardet, Jingshan Luo, Dan Ren, Michael Grätzel, Xile Hu

L'Ecole Polytechnique Fédérale de Lausanne, Switzerland

Photoelectrochemical cells are widely studied for conversion of solar energy into chemical energy. However, they have rarely been studied for the synthesis of high added-value organic molecules. Here we use hematite as an abundant and robust photoanode for non-directed arene C–H amination. Under illumination, the holes are generated in hematite and oxidize electron-rich arenes to radical cations, which further react with azoles to form C(sp²)-N bond. The reaction was carried out in an undivided cell with simple reaction condition. Moreover, unusual *ortho* selectivity was achieved probably due to the hydrogen bonding between the substrates and the solvent, hexafluoroisopropanol (HFIP). The method is successfully applied for the late-stage functionalization of several pharmaceutical molecules.

