RUTHENIUM-BASED RED LIGHT PHOTOCATALYSIS

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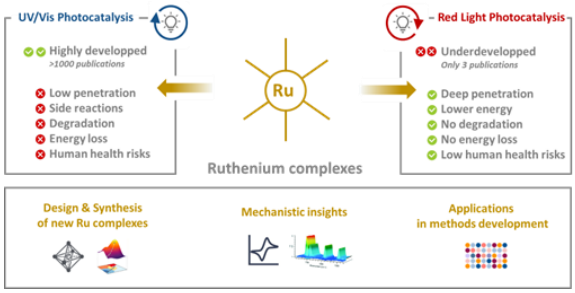
Photocatalysis offers mild conditions alternative for redox processes by converting light into chemical energy.[1] However, photocatalyzed reactions usually use wavelengths in UV-visible spectrum, which are known to have a poor penetration through solution and some functional group are sensitive to UV-visible.[2] In addition, other reactants can compete by absorbing in UV–visible.[3] Thus, photocatalysis using UV-visible light can be performed in flow-system or small scale but remains limited for larger scale.[4] To overcome these limitations, red light and Near Infrared (NIR) photoredox catalysts have been developed. The advantages of red and NIR light are higher penetration in solution and in biological tissues and lower energy photon.[5] These wavelengths also allow better selectivity of functional groups and therefore less chance to observe side products leading to better yields while overcoming the health hazard UV light represents for the operators.[6]



Inspired from pioneering results,[7,8] our group is investigating new potent photocatalysts usable in red wavelength. We have focused our effort on the activation of ruthenium-based photocatalysts in red wavelength. We applied this photocatalytic system to several reactions, and we have investigated mechanistic insights. This project is supported by HTE technology, which allow quick optimization of reactions.

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