Selective Bond Scission in Pyrazolo[1,2-*a*]pyrazolones under Visible Light

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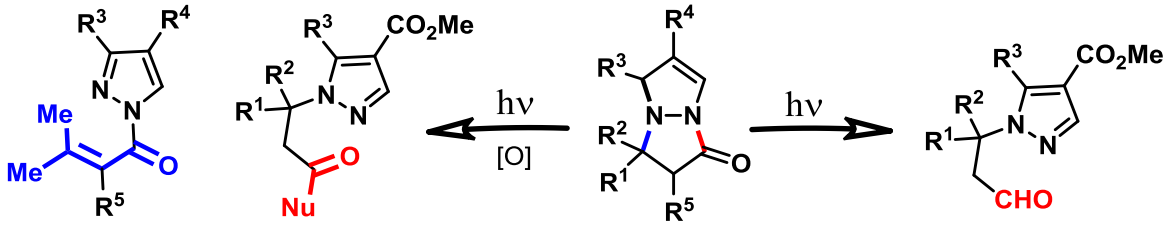
Pyrazolo[1,2-*a*]pyrazolones are fluorescent bicyclic compounds, which can absorb visible light and reach an excited state upon irradiation. This highly reactive excited state is sufficiently long-lived to undergo multiple transformations, which take place selectively depending on the reaction conditions. These photochemical transformations include homolytic C–N bond cleavage with intramolecular hydrogen atom transfer. Under mildly oxidative environment, oxidative ring opening takes place, accompanied by a reaction with nucleophiles to form a plethora of carbonyl derivatives. Under appropriate reaction conditions, deprotonation can also occur, resulting in N1-acryloyl-substituted pyrazoles. The selectivity of the reactions depends on the reaction conditions and was fine-tuned to afford the desired products. Altogether 3 distinct transformations into substituted pyrazoles were achieved under visible light irradiation, providing an efficient and diverse route to richly substituted pyrazoles. Such photoinduced reactions, which take place without external photosensitizers or photocatalysts, offer an environmentally friendly and cost-effective alternative to the use of toxic and expensive iridium and ruthenium catalysts used in photoredox catalysis.



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