NOVEL, SUSTAINABLE AND GREEN PHOTOOXIDATION PROTOCOLS: EASY ACCESS TO API's

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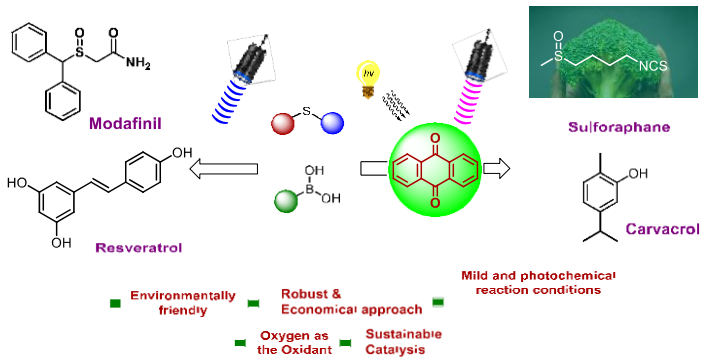
Sulfoxides and phenols comprise important classes of compounds in Pharmaceutical Industry, beginning with the arise of antibacterial ingredients in the beginning of the 20th century. Several sulfoxide- and phenol-containing molecules are known to display a salient pharmacological profile and are marketed drugs. Photochemical aerobic oxidations merge two interesting fields, photochemistry and air-mediated oxidation processes.[1] Although for many years, both areas received limited attention, the uprise of modern synthetic photochemistry led to an increased number of literature reports on oxygen-mediated oxidations. The last five years, photochemical aerobic oxidation of sulfides to sulfoxides and boronic acids to phenols have received great attention. In our group, we are aiming in developing novel, operationally simple and safe protocols easily to applied in industrial scale productions. Thus, we have developed a series of general, fast, mild, green and industrial-friendly photooxidation procedures.[2] Initially, we explored the role of wavelength irradiation towards sulfides and boronic acids aerobic photooxygenation to the corresponding sulfoxides and phenols, respectively. Low-catalyst loading (up to 1.0 mol%) anthraquinone-mediated protocols (CFL or LED lamps) and photocatalyst-free aerobic protocols (LED lamps) are reported, combining short reaction time and overcome the unwanted overoxidation reaction.[2] We applied these photooxidation protocols towards the synthesis of Sulforaphane, a promising anti-cancer agent and a potential SARS-CoV-2 inhibitor, and Modafinil, a drug used to treat narcolepsy symptoms.[3]



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