INDUCED BY LIGHT OXIDATION-ADDITION REACTIONS AND ITS APPLICATION IN SYNTHESIS OF SELECTED NATURAL COMPOUNDS

Recently, visible light, being a ubiquitous source of energy, attracted again the attention of synthetic organic chemists. Although photochemical reactions have been utilized in organic chemistry, traditional photochemistry suffers from the drawback of often being dependent on high-energy UV radiation. Furthermore, the photochemistry of many organic compounds is unknown and therefore many obstacles need to be overcome. Visible light photoredox processes have recently found many applications in organic synthesis, but the general interest in the field started much earlier. Unlike thermal reactions, photo- redox processes occur under mild conditions and do not require radical initiators or stoichiometric chemical oxidants or reductants. Typical irradiation sources are LEDs or household lamps, which are cheaper and easier to apply than specialized UV reactors used in classical photochemistry.

The aim of this project is to develop efficient methods for the transformation of *N*,*N*-dimethylamine derivatives to the aldehydes and their further transformation to the α,β-unsaturated compounds using combination of visible light and organocatalysis. Described concept constitutes not only a useful tool for *N*,*N*-dimethylamino group conversion, but also excellent strategy for carbon-carbon bond formation. Advantages of this comprehensive method will be presented in the formal synthesis of Aurantioclavine - a natural compound isolated for the first time from the fungus *Penicillium aurantiovirens* in 1981 with interesting biological properties. This compound is also a valuable precursor used in the biosynthesis of various compounds of the group *Communesin* indicating various cytotoxic properties.

That concept gives hope for above methods to be used in the synthesis of natural compounds because of the low cost synthesis, the availability of reagents and simplicity of execution in comparison with the currently known methods.