

Exploration of formamide's reactivity to synthesize new heterocyclic compounds with fluorescent properties

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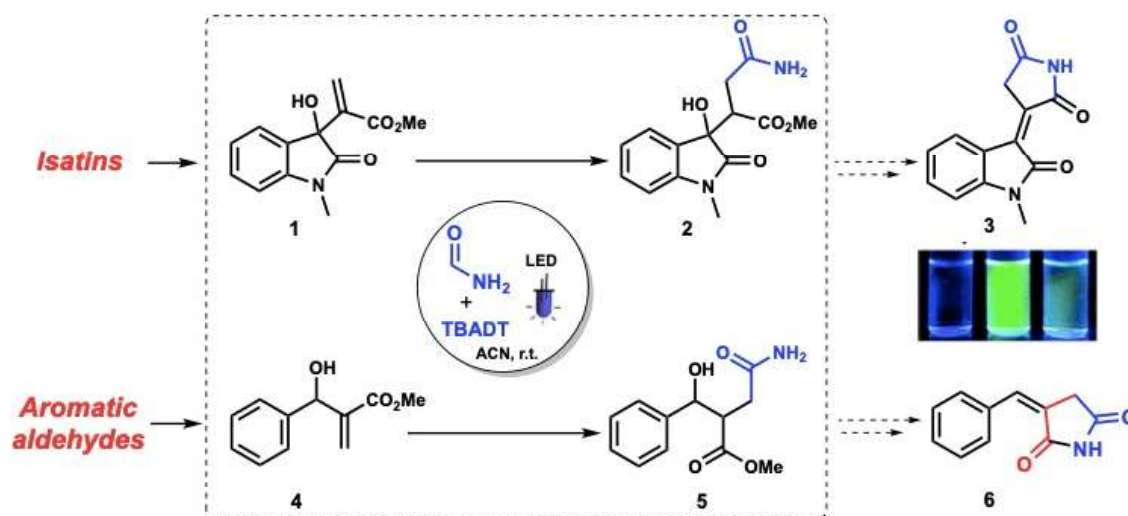
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Highlights

This work aims the synthesis of new heterocycles that present fluorescent properties. The reactivity of both – isatin derivatives and aromatic aldehydes – and formamide will be explored under radical reaction conditions.

Resumo/Abstract

Materials with fluorescence properties are desired due to their applications in the areas of analysis, electronics and photonics. Isatin is a compound with several functional groups whose reactivity can be explored to synthesize new π -conjugated heterocycles. Aromatic aldehydes present a carbonyl group that could display a similar reactivity. This work will follow two synthetic routes based on the incorporation of formamide, in which we expect to develop and characterize new materials that present fluorescence.



The reference compound for the upper synthetic route could be obtained through methylation of commercially available isatin with CH₃I in DMF (62% yield). The Morita-Baylis-Hillman reactions of *N*-Me-Isatin and benzaldehyde were performed in THF or no solvent to obtain products **1** and **4**. In both cases, DABCO was employed as a catalyst, and low to moderate yields were obtained (24-67%). UV-Vis spectra were obtained for both (**1** and **4**) in order to determine the best LED lamp to produce the carbamoyl radical from formamide, using TBADT as a catalyst. Exploratory experiments were performed for the carbamoylation reaction, and 100% consumption of the substrates were identified by GC-MS analysis for both cases. Our next step is to evaluate the substrate scope for both systems, and apply continuous flow conditions in the fotocarbamoylation reaction.

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