Title: Highly Selective Alkylation method to Prepare a Coumarin compound

INVENTORS: Prof. Ravi P Singh, Department of Chemistry

KEYWORDS: Coumarin, Selective, C-7 alkylation, Visible light

DOMAIN: Chemistry

SUMMARY:

The invention relates to an optimized method for preparing a coumarin compound (Formula I). The reaction process is a highly selective C-7 alkylation reaction that requires visible light, an organic solvent, and a catalyst to mediate the reaction in photo-redox conditions. The method allows selective functionalization of small molecules on specific sites and enables modification after the initial synthesis. The selective functionalization of Coumarin can offer routes to unique molecular libraries with unprecedented properties. Such properties are then widely used for medicinal purposes such as anticoagulant, anti-neurodegenerative, anticancer, antioxidative, antimicrobial, anti-inflammatory and analgesic, antidiabetic, anti-depressive, and other bioactive agents as well as supramolecular medicinal drugs, diagnostic agents and pathologic probes, and biological stains.

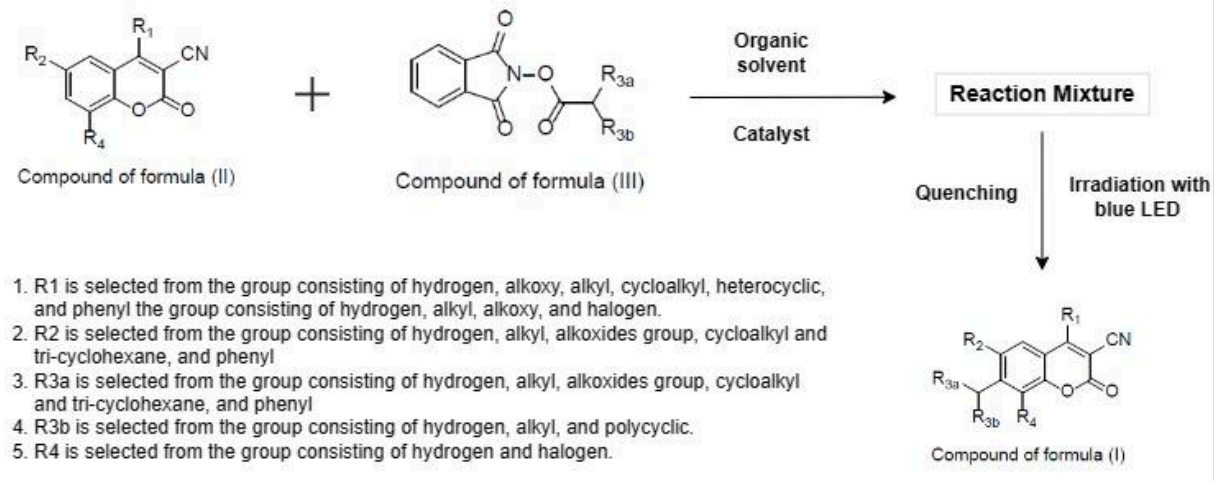

Figure: chemical reaction to produce coumarin compound and the reactants used in the reaction

ADVANTAGES:

1. An efficient method to produce coumarin compound.
2. Highly site-selective on the compound.
3. Mild reaction conditions.
4. High yield.

APPLICATION: Coumarin based drugs.

SCALE OF DEVELOPMENT: Proof of Concept and drug development demonstrated at a lab scale. In-vitro studies are done.

TECHNOLOGY READINESS LEVEL: TRL 3

IP STATUS: Indian Patent Application No. 202211041300