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NIR-emitting quinone-fused coumarin dyes: aqueous mediated, catalyst free synthesis and their optical properties

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Water mediated organic synthesis is a fascinating approach in chemistry. We have attempted catalyst free synthesis of thermally stable near infra-red (NIR) emitting quinone fused coumarins with a benzothiazole/benzimidazole acceptor in aqueous medium. The synthesis was attempted using naturally occurring 2-hydroxy-1, 4-naphthoquinone (Lawsone). It is an efficient and environmentally friendly approach for the diversity oriented synthesis of 5, 6-quinone fused 2-pyrone containing compounds. It is a highly productive one pot synthetic method at room temperature that avails commercially accessible materials. In addition, this method has a very short reaction time and milder reaction conditions with an easy separation process. The composition of catalyst free and room temperature condition ensure a green approach towards the excellent practice of the synthetic method. These reactions offer functional NIR emitting fused coumarin compounds extended emission to 810 nm. Structural, spectroscopic and morphological characterization of the material confirms the purity, integrity and future potential materials for high technological applications. Eventually this method gives structurally interesting compounds having optical and pharmacological significance.

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