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Preparation, marriage chemistry and applications of graphene quantum dots–nanocellulose composite: A brief review
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Abstract
Graphene quantum dots (GQDs) are zero-dimensional carbon-based materials, while nanocellulose is a nanomaterial that can be derived from naturally occurring cellulose polymers or renewable biomass resources. The unique geometrical, biocompatible and biodegradable properties of both these remarkable nanomaterials have caught the attention of the scientific community in terms of fundamental research aimed at advancing technology. This study reviews the preparation, marriage chemistry and applications of GQDs–nanocellulose composites. The preparation of these composites can be achieved via rapid and simple solution mixing containing known concentration of nanomaterial with a pre-defined composition ratio in a neutral pH medium. They can also be incorporated into other matrices or drop-casted onto substrates, depending on the intended application. Additionally, combining GQDs and nanocellulose has proven to impart new hybrid nanomaterials with excellent performance as well as surface functionality and, therefore, a plethora of applications. Potential applications for GQDs–nanocellulose composites include sensing or, for analytical purposes, injectable 3D printing materials, supercapacitors and light-emitting diodes. This review unlocks windows of research opportunities for GQDs–nanocellulose composites and pave the way for the synthesis and application of more innovative hybrid nanomaterials.

Author Keywords
Composite; Graphene quantum dots; Nanocellulose

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