Fluorescent sensing probes based on GQDs immersed into Nanocellulose hydrogels

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Self-assembly of nanomaterials through reversible noncovalent forces is an excellent choice to fabricate responsive sensing probes. Attempts to incorporate fluorescent nanomaterials into gels were reported [1,2,3]. Our preliminary experience in the fabrication of gels has demonstrated that mixing an appropriate fluorescent system and a gelator [3,4] at the adequate proportions resulted in the formation of reversible transparent hydrogels; furthermore, the introduction of nanoparticles sometimes even accelerates the gel formation.

Herein, it is shown the simple preparation of fluorescent nanocellulose gels (Fig. 1) containing graphene quantum dots (GQDs) for sensing applications. This 3D network of nanodots assembled into nanofibers exhibits a significant enhancement of its photoluminescence properties as well as a strong sensing response towards several substances in comparison to those in solution.

The structural combination of fluorescent nanodots and nanocellulose hydrogels opens up new frontiers for nanomedicine inspired in biosensing, drug delivery and self-healing.

References

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Figure

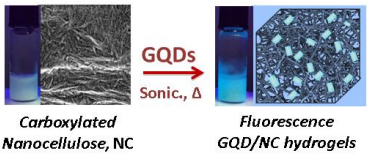

Figure 1: Fabrication of fluorescence hydrogels based on graphene quantum dots and nanocellulose.