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# Preparation of Graphene Quantum Dots through Liquid Phase Exfoliation Method

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## Abstract

Here we report the preparation of low defect blue fluorescent graphene quantum dots (GQDs) through microwave expansion and liquid phase exfoliation (LPE) of graphite flakes with a high preparation yield of 0.63 g of GQDs per 1 g of original graphite substrate. The maximum emission in the prepared GQDs occurs at 467 nm for 370 nm excitation. The photoluminescence quantum yield of the prepared GQDs was measured as 3.4 %. Prepared GQDs are composed of carbon, oxygen and nitrogen elements. They have high percentage (86 %) of C-C/C=C, indicating few structural defects of the graphitic core, due to lesser number of edge- or surface-located oxygenated functional groups. This preparation technique, unlike others, does not require additional chemical components and is energetically undemanding. Furthermore, the reported method is also suitable for scalable preparation of quantum structures from other two-dimensional layered materials.

## Keywords

carbon material; nanoparticles; liquid phase exfoliation; microwave expansion; luminescence

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