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# Electrolyzing synthesis of boron-doped graphene quantum dots for fluorescence determination of Fe<sup>3+</sup> ions in water samples

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## Abstract

This work reports a facile electrolyzing method to synthesize boron-doped graphene quantum dots (BGQDs) and uses the BGQDs as a fluorescent probe to determine Fe<sup>3+</sup> ion levels in water samples. The BGQDs were produced by oxidizing graphite in an aqueous borax solution at pH 7; then, the borate solution was filtered with BGQDs, and the borate was dialyzed from the filtrate, leaving a solution of BGQDs in water. The amount of the B in the BGQDs can be adjusted by changing the concentration of borax used for the electrolyte. The excitation wavelength- and B amount-dependent fluorescence characteristics of BQGDs were studied. The fluorescence intensity of the BGQDs is measurable in real

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<sup>1</sup> Chen and Wu contributed equally this work.

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