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Curcumin-assisted ultrasound exfoliation of graphite to graphene in ethanol

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### Abstract

In this paper, we demonstrated a simple and cost-effective method to produce graphene from graphite in ethanol using ultrasound assisted with curcumin. The influence of curcumin concentration, starting graphite amount, sonication power, and sonication time on the graphene concentration was studied schematically. The  $\pi$ - $\pi$  interaction between curcumin and graphene, being confirmed by FTIR spectrum, facilitate the exfoliation of the graphite into graphene. The concentration of the graphene in the ethanol reached up to  $1.44 \text{ mgmL}^{-1}$  and the exfoliated suspension was relatively stable. The content of monolayer, bilayer, and multilayer in the exfoliated graphene suspension were 21%, 37%, and 42%, respectively. The as-prepared graphene sheets were free-defect. This novel approach may not only enable to exfoliate the graphite into graphene but also to make the graphene-curcumin hybrid which might find applications in pharmaceutical industry.

**Keywords:** Curcumin, Graphene, Liquid phase exfoliation,  $\pi$ - $\pi$  interaction

### 1. Introduction

Graphene is an emerging novel material in the science and technology of nanoelectronics, energy storage, functional composite materials and medical applications [1-3]. The increasing demand for graphene in a wide range of application area requires developing simple and

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