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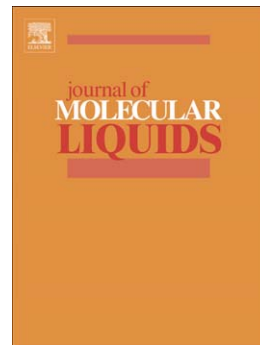
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## Preparation of silica-graphene nanohybrid as a stabilizer of emulsions

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### Abstract

In the present study, a novel silica-graphene nanohybrid was synthesized through a facile and single step chemical vapor deposition of acetylene on silica aerogel in the presence of hydrogen as a reducing agent at atmospheric pressure and 600 °C. The physiochemical properties of the nanohybrid were thoroughly characterized by XRD, TGA, Raman, BET, DLS, FT-IR, SEM, and TEM. The amount of graphene in the silica-graphene nanohybrid was found to be 16 wt% while a remarkable specific surface area about 843.64 m<sup>2</sup>/g has been accomplished. The as-prepared nanohybrid was employed for stabilization of decalin/water emulsion. In addition, the effective factors on the droplets size and condition of stabilization for emulsion preparation were investigated through Taguchi L<sub>16</sub> statistical design. Ultimately, the Wilhemy plate method shows that by dispersion of nanohybrid in water/decalin emulsion the interfacial tension (IFT) can be considerably declined from 55 to 30.12 mN/m.

**Keywords:** Nanohybrid, Emulsion, Silica-graphene, Taguchi design

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