

Abstract Submitted  
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**Dispersions of non-covalently functionalized graphene with minimal stabilizer** DORSA PARVIZ, SRIYA DAS, FAHMIDA IRIN, MICAH GREEN, Department of Chemical Engineering, Texas Tech University — Pyrene derivatives are promising substitutes of surfactants and polymers for stabilization of graphene in aqueous dispersions. We demonstrate that pyrene derivatives stabilize single- to few-layer graphene sheets, yielding exceptionally higher graphene/stabilizer ratio in comparison with conventional stabilizers. Parameters such as stabilizer concentration, initial graphite concentration, type and number of functional groups, counterions, the pH and the polarity of dispersion media were shown to affect the adsorption process and final graphene concentration. The effectiveness of pyrene derivatives is determined by the type, number and electronegativity of functional groups and counterion. It also depends on the distance between functional group and pyrene basal plan, the pH of the dispersion (as shown by zeta potential measurements) and the relative polarity between stabilizer and solvent. Stability of the dispersions against centrifugation, pH and temperature changes and lyophilization was investigated. These dispersions also show promise for applications to polymer nanocomposites, organic solar cells, conductive films, and inkjet-printed electronic devices.

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