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Investigation of graphene nanosheets stable suspensions and graphene films obtained by spin coating technique

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Graphene has been deeply studied recently due to its wide applicability in materials science, specially in thin conducting films for sensors [1-3]. Several methods can be used in order to obtain graphene sheets, such as: CVD and epitaxial growth, mechanical exfoliation, colloidal route, etc [1]. In this study graphene oxide was obtained through Hummers method [4]. The material was then sonicated for exfoliation and then reduced using two reducing agents, catechol and hydrazine. Thin films were obtained by spin coating two substrates: glass and PET. The obtained materials were characterized by FTIR, NMR, UVVIS, AFM, SEM, contact angle analysis (Figure 1), and zeta potential. The dispersability of graphene sheets increased in the presence of PSS surfactant and in basic pH. The films characteristics are strongly dependent on the dispersion degree of the suspension, which makes necessary an optimization of suspensions properties in order to obtain homogeneous films. The graphene films obtained by spin coating open a new possibility to applications.

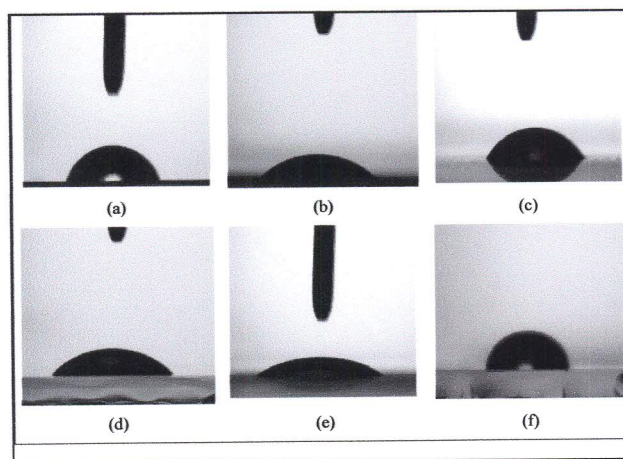


Figure 1: Contact angle of water droplets (α) in: a) PET ($\alpha = 72^\circ$); b) PET + graphite oxide film ($\alpha = 40^\circ$); c) PET+graphene film ($\alpha = 63^\circ$); d) glass ($\alpha = 53^\circ$); e) glass + graphite oxide film ($\alpha = 28^\circ$); f) glass + graphene film ($\alpha = 68^\circ$).

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