

Graphenide Solutions and Films

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Up to this time, there has been substantial progress in the production of graphene on a large scale through solution route, which can replace the mechanical exfoliation and epitaxial growth on silicon carbide method.

It was reported by our group recently that a method consists in exfoliating graphene from graphite and dispersing the graphene in organic solvents without applying sonication or surfactant¹⁻⁴. Our research is devoted to study the solutions of negatively charged graphene (graphenide) which are prepared from graphite intercalation compounds (GICs).

The GICs are synthesized by reduction of graphite with an alkali metal, typically with potassium. Three different potassium GICs were synthesized and studied by resonant Raman scattering by varying the exciting wavelength from UV to infrared.

Furthermore, films were prepared from graphene solutions and characterized by different techniques. The electric property of the films can be largely improved by post-treatment. We found that adequate treatment can efficiently eliminate the solvent trapped between the graphene flakes, improve graphene stacking order and electrical properties.

References

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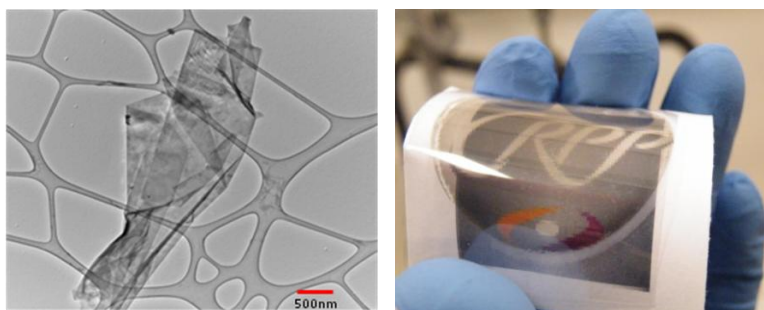


Figure: TEM photo of graphene flake and graphene based transparent conductive film