

## Synthesis and characterization of graphene oxyfluoride

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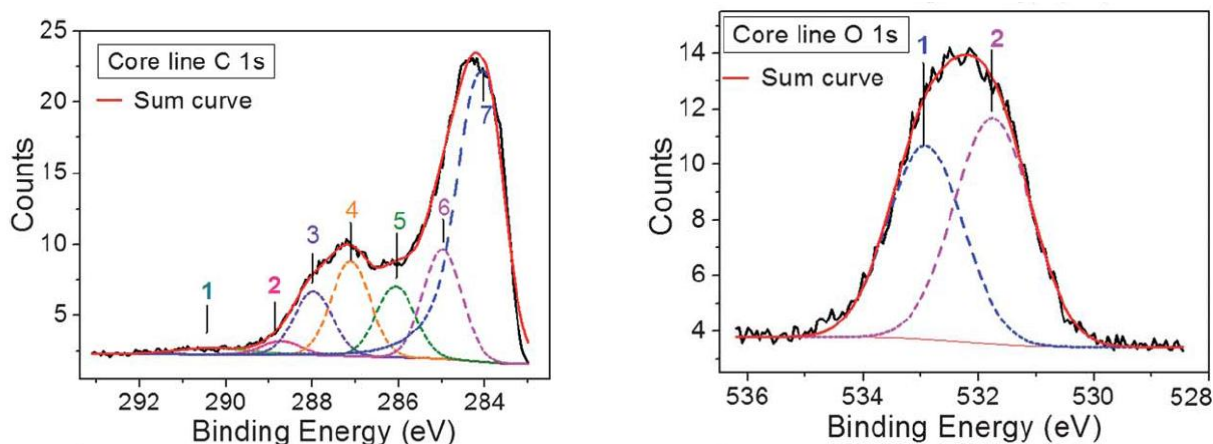
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Chemical functionalization of graphene is used to thinly modify its electrical and chemical properties. In particular, covalent bonding to halogen chemical elements leads to formation of a band gap useful for the realization of electronic devices such as sensors.

In this work we describe an easy method to realize an oxyfluorination of graphene layers. It is based on the electrochemical intercalation of graphite, that could be used for adding various functional groups to the graphene lattice. The system was fully characterized in terms of chemical composition, structural and electrical properties. In particular Raman spectroscopy was used to discriminate between single and multi-layered systems. The electrical properties revealed hopping based conductivity and metallic like at low and high carrier concentration respectively. Moreover it was observed a colossal negative magneto-resistance which makes this novel material suitable for both fundamental research and graphene-based applications.

### Figures



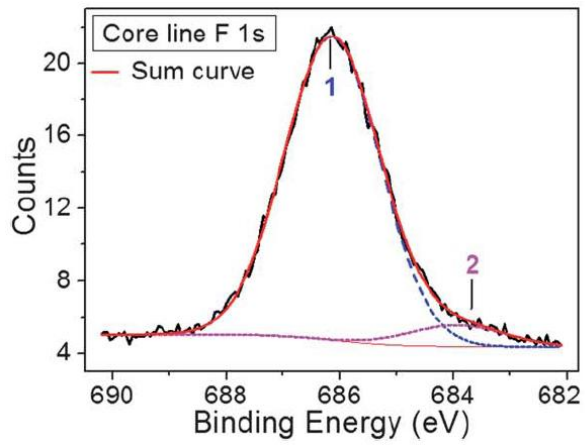


Figure 1, 2 and 3. XPS analysis of graphene oxyfluoride: C1s, O1s and F1s core lines showing the chemical bonds formed