# NEW ALTERNATIVES TO GRAPHITE FOR GRAPHENE PRODUCTION BY SOLVENT EXFOLIATION

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The preparation of graphene by chemical methods, such as the graphite oxide or the solvent exfoliatin routes, offers the possibility of producing it on a large scale and, at the same time, of controlling its quality, depending on: a) the characteristics of the parent graphite[1] or the experimental conditions used [2, 3].

We recently reported that graphene oxides with standard characteristics can be obtained from pregraphitic materials (cokes) without the graphitization step.[4] Following with these investigations we studied herein the preparation of solvent exfoliated graphene materials directly from the pregraphitic precursor. The characteristics of the graphene materials obtained from coke and the correspondent graphite were determined.

Sonication of the raw coke in N-Methyl-pyrrolidinone for 8h led to the formation of exfoliated graphene (EG-C and EG-CG from coke and graphite respectively) in the form of monolayers and more preferment few layers graphenes, as determined by AFM measurements (Figure 1), results being similar to those obtained from graphite. TEM images also confirm the exfoliation of coke and graphite (Figure 1)

The different structure of the coke when compared to that of graphite is reflected in the composition of the exfoliated graphenes obtained from both materials. Thus, as determined by XPS, the carbon content in sp2 hybridization in EG-C is lower than that of EG-CG (67.0 % compared to 78.6 %), while there is a significant increment of the C-N bonding (12.3% compared to 7.3%) in this sample (Figure 1) from the NMP.

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## References

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## Figures

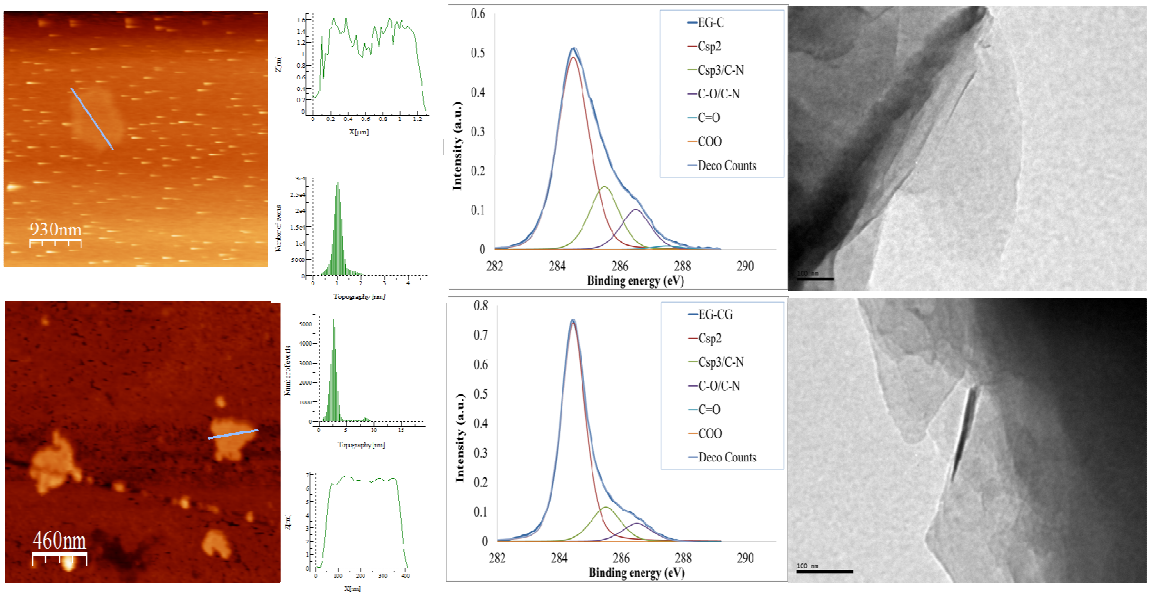


Figure 1: AFM, TEM and XPS characterization of solvent exfoliated graphenes from coke (EG-C) and graphite (EG-CG)