

# Electrically conductive pressure sensitive adhesives containing graphene oxide

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## Abstract

Adhesion substances found the wide application in the field of electronics and electrical engineering. Due to the unique structure, electric, thermal and mechanical properties, graphene oxide hold great promise for potential applications including electrically conductive adhesives [1-3]. Electrically conductive pressure sensitive adhesives (PSA) containing graphene oxide are environmentally friendly alternative to so far applied PbSn solder which are being withdrawn of the electronic assembly as an effect of applicable Directive (Restriction of Hazardous Substances - RoHS) making impossible applying lead, cadmium, mercury and hexavalent chromium in electronic components [4-5].

In this study, receiving and properties of electrically conductive pressure sensitive adhesives containing graphene oxide will be described.

Detailed description of the graphene oxide was carried out with UV-Vis spectroscopy, FT-IR spectroscopy, Raman spectroscopy and confocal laser scanning microscopy. Conducted series of experiments pointed up that acrylic pressure-sensitive adhesives basis was synthesised with good initial performances, excellent adhesion, good adhesion and high tack. The electrical conductivity is incorporated into acrylic adhesive polymer after adding electrically conductive additive [6], graphene oxide. Functional electrically conductive phase is compound from nanostructures of coal which provides the significant resistance reduction of adhesive, increasing in addition the conductance [2,4,7]. After an addition of graphene oxide electrical conductivity of the PSA layers was examined and the most important physicochemical and mechanical properties of pressure-sensitive adhesives such as peel adhesion, shear strength and tack were determined by standard A.F.E.R.A. (Association des Fabricants Europeens de Rubans Auto-Adhesives) procedures. Methods of receiving electrically conductive pressure sensitive adhesives containing graphene oxide weren't described so far in literature and are not commercially available. This type of conductivity PSA including graphene oxide are promising new composite materials which can be applied in many areas of electronic and electrical engineering industrial for the shielding of the electromagnetic and radio interference, earthing and carrying static charges, for fixing elements of electronics, for the connecting an electric wires replacing soldering and of many other applications.

## References

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## Figures

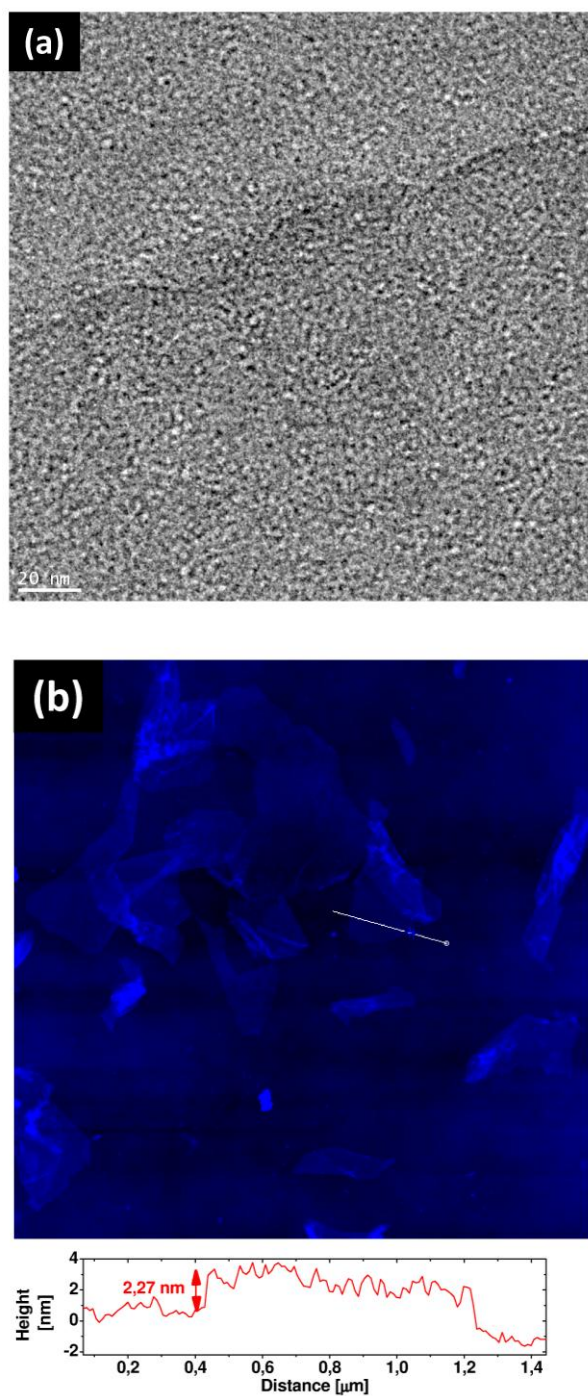


Figure 1. Transmission electron microscopy (a) and atomic force microscopy (b) images and height profile (down panel of image b) of graphene oxide.