Online Perspectives Journal: Exact & Engineering
Proceedings of the 5th Research & Development PROVIC/PIBIC Seminar
2nd CNPq Scientific Initiation Meeting,
Vol. 10, Nº 29, Supplement, 2020

Assessment of graphene oxide anti-corrosion properties

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Metal alloys deterioration, either by electrochemical or chemical action, is almost inevitable, but this process can be slowed down by the use of techniques aiming to increase such alloys' resistance. These techniques interpose a film between substrate and corrosive media. Several materials have been regularly used to such purpose; however, one material has increasingly called attention for multiple applicability due to its properties, structure and abundance, besides being environmental benign: graphene oxide. The aim of this paper is to assess graphene oxide anti-corrosion properties, once several other properties have been studied before. Graphene is a material made by allotropic forms of carbon atoms which fullerene, carbon nanotubes, graphite and diamonds are examples of. Methods for graphene production only result in small amounts of the material; therefore, chemical routes are most used for large scale production in a process that mixes strong oxidizing agents and acids. Graphene oxide will be deposited by dip-coating technique, which consists in a substrate timed immersion in colloidal solution and presents advantages such as simplicity, controllability, reliability and reproducibility. Subsequently, substrate-coating units will be immersed in different corrosive media for assessment of graphene oxide as an anti-corrosion coating material. It is expected that the use of graphene oxide as coating becomes and efficient technique for corrosion resistance improvement and meets requirements of chemical resistance to corrosive media, low permeability, substrate compatible thermal expansion and adherence.

Keywords: Graphene oxide, Anti-corrosion properties, Coating.

Supported by: ISECENSA