

**Área: INO**

## Synthesis, characterization, and application of rGO/Ni–Co nanocomposites for aqueous batteries

**Rou-Yi Pan (IC)\* and Eduardo G. C. Neiva (PQ)**[rpan@furb.br](mailto:rpan@furb.br) ; [eneiva@furb.br](mailto:eneiva@furb.br)*Department of Chemistry, Regional University of Blumenau (FURB), Blumenau, SC, Brazil**Keywords: Electrosynthesis; Hexacyanoferrate; Thin films; Energy storage.*

### Highlights

- ✓ Improvement in charge transfer and cycling stability of rGO/Ni-Co;
- ✓ Better growth stability in K<sup>+</sup> electrolyte than in Na<sup>+</sup>/Li<sup>+</sup>;
- ✓ Structure-performance confirmed by XRD, SEM, EDS, and EIS.

### Resumo/Abstract

Aqueous batteries are a sustainable alternative that do not use Li in their composition, which is expensive, flammable, and harmful to the environment. Graphene is an innovative material being applied in several areas — especially in energy — due to its stability and high electrical conductivity. In this work, thin films of reduced graphene oxide (rGO) and Ni–Co were employed via a modified polyol method on FTO substrates (fluorine-doped tin oxide) to carry out the electrosynthesis of hexacyanoferrate in K<sub>3</sub>[Fe(CN)<sub>6</sub>] solutions with KCl, NaCl, or LiCl as the supporting electrolyte. Subsequently, the nanocomposites were characterized by electrochemistry, XRD, SEM, EDS, and EIS, and evaluated for energy storage.

### Agradecimentos/Acknowledgments

The authors thank FAPESC and INCT-Nanocarbono for financial support; CLAIMS for equipment; FURB for infrastructure; and GQM-UFPR for characterizations (SEM, EDS, XRD).