Contribution ID: **1125** Type: **Oral**

Physicochemical properties of hydrothermally synthesized nanocomposites of graphene-oxide and Zn/Ga-dopped cobalt ferrite

Wednesday 26 October 2022 15:15 (15 minutes)

The formation of stable aqueous suspensions and the possibility of surface functionalization make graphene oxide (GO) a great material for composite materials. In this work, physicochemical properties of composites of GO and CoFe2O4 (CFO), including CFO doped with zinc (CFO_Zn) and gallium (CFO_Ga) were investigated. CFO, CFO_Zn, CFO_Ga nanoparticles were prepared by the solvothermal method with oleic acid as a surfactant. In order to obtain hydrophilic particles, ligand exchange with dihydrocaffeic acid (DHCA) was performed. Graphene-oxide was synthesized with modified Hummers'method. Nanocomposite has been obtained by adding CFO(_Zn/Ga) NPs to a GO suspension with nominal loading of 5 to 15 wt.%, followed by homogenization and hydrothermal treatment (T=120 ℃, t=3 h). Complete oxidation of graphene i.e. formation of GO was confirmed by X-ray diffraction and FTIR analysis. TEM and SEM images of nanocomposites show that the shape and size of CFO nanoparticles remain unchanged on GO layers. A difference between the distribution density between 5 and 15 wt.% is also observed. FTIR results have shown that a hydrogen bond between CFO nanoparticles and partially reduced GO was established. Electrochemical properties of composites were investigated by cyclic voltammetry and it was shown that all composites are stable at polarization rates of 5-400 mV s-1. Also, the specific capacities of all composites were calculated and the best electrochemical properties, in terms of the highest specific capacity, were shown by the composite with 15 wt.% CFO.

Author: GRUJIČIĆ, Marija ("VINČA"Institute of nuclear sciences –National institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia)

Co-authors: BAJUK-BOGDANOVIĆ, Danica; JOVANOVIĆ, Sonja; JOVANOVIĆ, Zoran; MRAVIK, Željko; PEJIČIĆ, Milica; STOJKOVIĆ SIMATOVIĆ, Ivana

Presenter: GRUJIČIĆ, Marija ("VINČA"Institute of nuclear sciences –National institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia)

Session Classification: Condensed Matter Physics

Track Classification: Condensed Matter Physics