

ABSTRACT

The goal of this PhD thesis was to synthesize and characterize, from morphological, structural and electrochemical point of view, a series of nickel-copper layers, deposited on steel substrates, which may be used as potential plates components for the supercapacitors manufacture.

The thesis has two main parts:

- The first part, consisting of 4 chapters, related to literature survey on the history, classification, and the manufacture of supercapacitors, as well as with a comparison of various energy storage systems versus supercapacitors;

- The second part, consisting of 3 chapters, dealing with the experimental procedures, methods, results, discussions and optimization of the operational parameters used for the deposited layers.

The nickel-copper layers were electrochemically deposited, taking into account the effect of current density, deposition time and temperature, while their characterization was carried out using a range of modern morphological, structural and compositional investigation methods, such as X-ray diffraction, Raman spectroscopy, scanning electron microscopy and dispersive energy spectrometry.

The experimentally obtained data were subjected to an optimization procedure in order to identify the operating parameters combinations which yield the best results for the intended application.

The thesis also contains a chapter of general conclusions, a list of the author's publications and conference attendances, references and annexes.