

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

RuO₂/Graphene composites for super-capacitor electrodes¹ FATIMA AMIR, TARIQ RAMLALL, St John's University, REBECCA FOREST, University Of Houston — Metal oxides/graphene composites show significant improvement in their electrochemical proprieties compared to their individual constituents, such as high capacity, high rate capability and excellent cycling stability. Ruthenium dioxide (RuO₂) has been recognized as an important electrode material for water electrolysis, oxygen reduction, and super-capacitors. A crucial aspect of all these applications is their structural, morphological and electrical properties. We have synthesized RuO₂ from hydrolysis and oxidation of ruthenium tri-chloride RuCl₃, which we physically mixed to graphene and used to coat tungsten substrates. For comparison, we also have deposited commercial RuO₂ hydrate mixed with graphene on tungsten. The samples were then annealed at different temperatures. The effect of temperature has been studied in detail. Surface morphology analysis using a scanning electron microscope (SEM) shows smaller grain size at temperatures higher than 180 C. Structural properties obtained by using x-ray diffraction revealed an amorphous structure at temperatures lower than 180 C. The supercapacitance of the RuO₂/graphene electrode is found to be dependent on the surface morphology.

¹This project was supported by the Clare Booth Luce Foundation

Fatima Amir
St John's University

Date submitted: 08 Nov 2012

Electronic form version 1.4