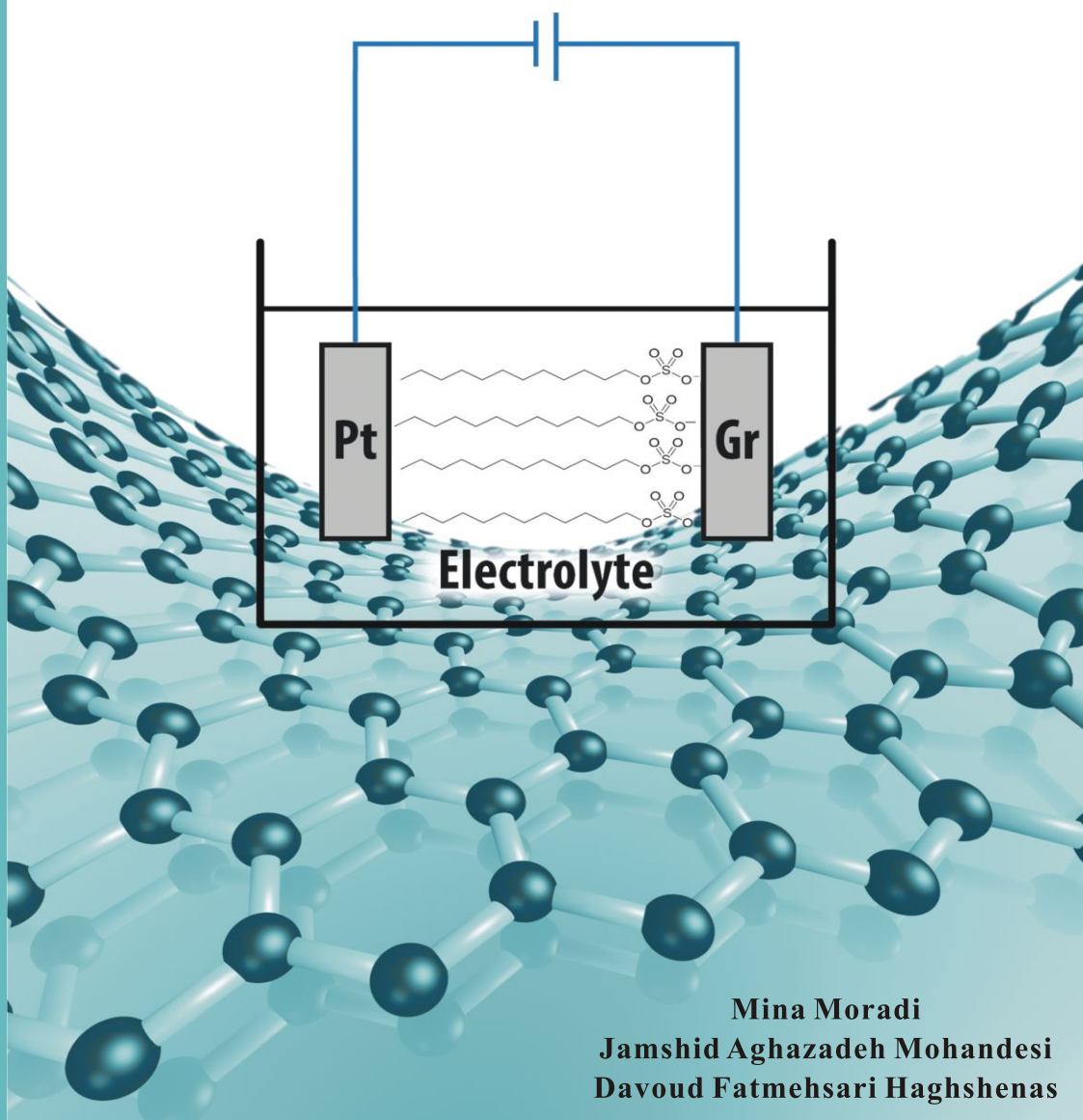


Electrochemical Fabrication and Mechanical Characterization of the Graphene/Poly Vinyl Alcohol Nanocomposites



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List of Symbols

1,3-Dimethyl-2-Imidazolidinone	DMPU
3-Aminopropyltriethoxysilane	APTES
Atomic Force Microscopy	AFM
Calcium Nitrate	$\text{Ca}(\text{NO}_3)_2$
Calcium Dodecyl Sulfate	$\text{Ca}(\text{DS})_2$
Current–Time Transient	CTT
Carbon Nano Tube	CNT
Deionized water	DI water
Differential Scanning Calorimetry	DSC
Dodecyl Sulfate Anion	DS^-
Fourier Transform Infrared	FT-IR
Field Emission Electron Microscopy	FESEM
Gamma- Butyrolactone	GBL
Graphene Sheet	GS
Graphene Oxide	GO
High Resolution Transmission Electron Microscopy	HTREM
Highly Ordered Pyrolytic Graphite	HOPG
Non-Isothermal Crystallization Peak Temperature	T_p
N-Methyl-2-Pyrrolidone	NMP
N,N-Dimethyl Acetamide	DMA

Lists of Symbols

Nuclear Magnetic Resonance	NMR
Poly Acrylonitrile	PAN
Poly(vinyl alcohol)	PVA
Poly(methyl metacrylate)	PMMA
Polystyrene	PS
Self-Assembled Monolayer	SAM
Sodium Dodecyl Sulfate	SDS
Surfactant Wrapped Graphene Sheet	SWGS
Silicon wafer	Si wafer
Transmission Electron Microscopy	TEM
Thermo Gravimetric Analysis	TGA
X-Ray Diffraction	XRD

Motivation

The challenges in nanotechnology and especially in carbon nanostructures can be considered in two aspects, the preparation/fabrication of the nanostructures and their properties regarding the specific applications. In order to explore and exploit the rich physics/chemistry of the graphene, new methods are required to tailor their properties. This book which is based on a master thesis is a contribution to the both above mentioned aspects through the following goals:

- Exploring a novel route for the synthesis of a stable suspension containing graphene sheets in aqueous solution.
- Characterization of the produced graphene sheets.
- Developing the Graphene/Poly(vinyl alcohol) nanocomposites.
- Evaluation of the mechanical properties of the nanocomposites.

