

# 3<sup>rd</sup> International Conference and Exhibition on Materials Science & Engineering

October 06-08, 2014 Hilton San Antonio Airport, USA

## An efficient, practical and environmental friendly method for the preparation of rigid polyurethane foams: Synthesis, characterization, and comparison with industrial sample

Elham Jaafarnia<sup>1</sup>, Abolfazl Ghaderian<sup>3</sup>, Amir Hossein Haghighi<sup>3</sup>, Zizi Abdeen<sup>2</sup>, Ali Boroomand<sup>3</sup> and Faramarz Afshar Taromi<sup>4</sup>

<sup>1</sup>Sharif University of Technology, Iran

<sup>2</sup>Egyptian Petroleum Research Institute, Egypt

<sup>3</sup>Islamic Azad University, Iran

<sup>4</sup>Amir Kabir University of Technology, Iran

Poly (ethylene terephthalate) waste bottles are recycled to preparing rigid polyurethane foams (RPUFs). The recycled method is glycolysis of Poly (ethylene terephthalate) waste bottles with diethylene glycol and propylene glycol as glycolysis agents in different glycol/polymer molar ratios. The structure and molecular weight of the glycolysis products were characterized using, FTIR, GPC spectroscopy analysis methods. Also, their hydroxyl number and viscosity were measured. The possibility of RPUFs fabrication using glycolysis products was investigated. The glycolysis products in GPC show a trimodal molecular weight distribution, as a proof for the presence of dimers, trimers and tetramers in the structure of recycling products. Glycolysis products are used for the fabrication of RPUFs with different densities. It was found that they have a proper range of densities were affected by the type and amount of glycolysis agent. The characteristics of foam were examined by FTIR, SEM, TGA, thermal conductivity coefficient and compressive strength. The properties of foams were compared with foam made with original polyol. The results revealed that the prepared foams have same properties compare the sample that is produced by original polyols.

### Biography

She completed MSc in Nanoscience and Nanotechnology from Sharif University of Technology.

[elhamjaafarnia2000@gmail.com](mailto:elhamjaafarnia2000@gmail.com)