



**MICROWAVE ENERGY AS A GREEN AND RAPID METHOD IN CHEMICAL  
RECYCLING OF FLEXIBLE POLYURETHANE FOAM WASTES: POLYOL  
RECOVERY**

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With attention to the increase in the use of polymeric materials especially polyurethanes (PU) due to their versatile characteristics, production of vast volume of wastes is inevitable. Therefore many efforts have been carried out for recovery of valuable materials and reuse for production of new products. In recent years, the reaction rate and the selectivity in product formation have been demonstrated to be greatly improved when chemical reactions are performed under microwave irradiation, and as a result, microwave chemistry has received much attention. In this communication, the chemical recycling of flexible polyurethane foam wastes were performed through glycolysis and hydroglycolysis process under microwave irradiation at atmospheric pressure. In order to saving energy consumption and for reducing of reaction times, all reactions were done in a commercial microwave oven at 160-180° C and various MW powers. In all reactions split phases appeared after complete foam digestion which upper phase contained amine free recycled polyol- which applicable in the new flexible foam formulation- and lower was brown liquid which usable in rigid polyurethane foam formulation. Finally FT-IR and NMR spectroscopy and physical properties of the recycled polyol was performed and compared by virgin one.