

## MICROWAVE ENHANCED GLYCOLYSIS OF POLYURETHANES

Aleksander Prociak, Dariusz Bogdal and Jan Pieluchowski

Department of Chemistry and Technology of Polymers, Cracow University of Technology,  
31-155 Kraków, ul. Warszawska 24, Poland

Nowadays, the substantial part of polyurethane scraps is still disposed of in landfill, and it leads to a loss of material value of polyurethane. Therefore, the alternative economical means are searched and among these, physical and chemical recycling represent promising means. At present glycolysis appears to be the most favourable method for chemical recycling of cellular polyurethanes on an industrial scale. In this way, liquid products are obtained which contain terminal hydroxyl groups and hence, are capable of forming new urethane materials [1,2].

The methods of limited depolymerisation of post-manufacture polyurethane scraps developed at Cracow University of Technology make possible reusing of glycolysis products in new formulations [3,4]. Recently, the investigations of glycolysis reactions of polyurethane (PUR) systems under microwave irradiations were carried out applying microporous elastomer and rigid foams of PUR as starting materials. For this purpose, the PUR scrapes were mixed together with ethylene or diethylene glycol in a weight ratio of 2-5:1 and irradiated under upright condenser for 30-120 min. with a catalyst.

The effects of the type of polyurethane waste, ratio PUR waste : glycol, reactants weight, reaction time on the glycolysates characteristic were analyzed. Prepared polyol products were examined in order to estimate significant parameters, from application point of view, such as density, hydroxyl number, water and solid content, viscosity.

Glycolysis products were used to substitute the petrochemical polyol mixture in new PUR compositions for foaming heat insulating materials useful for practical applications. Examples of such cellular polyurethanes modified with glycolysates are presented.

### References

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