

## CHEMICAL RECYCLING OF PET, MODIFICATION OF ISSUED POLYOLS AND SYNTHESIS OF ENERGETIC BINDERS

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### ABSTRACT

PET is heated with an excess of DEG in presence of a catalyst (two were used: Zinc acetate, Sodium bicarbonate) is converted through a transesterification reaction to short-chain fragments. The glycolysis reaction takes place at 230 to 240 °C with different ratio of (DEG/PET) and different duration too [1-3]. The principal products are polyols polyesters having aromatic rings. These polyols must be purified so they undergo a distillation under pressure after a stage of transesterification. The last product is used to get a polyurethane resin which is an energetic binder for propellants [4-5]. In addition to the physical measurements such as density, kinematic and dynamic viscosity, the main used characterization method was Infrared spectroscopy (FTIR) to follow the transesterification step and to identify issued polyols and those after modification by post-azidation (-N<sub>3</sub>). By the use of adiabatic calorimeter, it's found that the prepared solid propellant shows a higher energetic potential than those undertaken previously such as PLASTISOL (PVC as binder) with the same formulation within the same components. An increasing of more than 39 % of efficiency is highlighted.

**Key words:** PET, recycling, PUR resin, FTIR, energetic binder, solid propellant, calorimetric measurements.

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