

## LONG LASTING TECHNOLOGY FOR PET RECYCLING

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### Abstract

*This paper presents an original technology of transforming PET waste into the original raw materials and then of introducing them again into a PET processing cycle. The method used is the oxidizing-catalytic one of breaking the ester connections and releasing the terephthalic acid. The oxidizing mixture is formed of 95% nitric acid of 63-65% concentration, 5% hydrochloric acid of 37%, 0.01 % ammonium metavanadate and 0.05% copper chloride as compared to the oxidizing mixture. The reaction takes place in 2 phases: in the first phase, the PET waste are broken up, weighed, and inserted into a vessel and then melted at temperatures of 230-250<sup>0</sup>C, until you obtain a fluid solution. Over the oxidizing mixture, the polymer melting was added, previously heated at 80-90°C. Suddenly, it takes place a violent reaction with massive release of nitrogen, forming a solid, spongy mass, containing the glycolic monoester of the terephthalic acid resulted after the breaking of the ester connection from the polymeric chain. In the second phase, the reaction mixture was separated, the solid mass was transferred into a vessel to be broken up until becoming powder. This powder was introduced into a reaction balloon and the oxidizing mixture was poured over. The proof was stirred for 30 minutes, at 110-120°C, after which it was cold, screened and washed several times with distilled water, until the complete removal of the oxidizing mixture and then dried for 3 hours at 120°C. The FT IR spectrometrical analysis shows that the product obtained after the oxidation reaction is the terephthalic acid.*

**Key words:** offals, PET, terephthalic acid, recycling.

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