



**IN-SITU POLYMERIZATION OF ϵ -CAPROLACTAM IN PRESENCE OF AMMONIUM POLYPHOSPHATE
TOWARD FIRE RETARDANT PA6**

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Anionic ring-opening polymerization of ϵ -caprolactam leads to the formation of polyamide 6 (PA6). This reaction takes place at a significantly faster reaction rate and gives a narrower molecular weight distribution than the other techniques. Due to this advantage, anionic polymerization of ϵ -caprolactam in presence of ammonium polyphosphate towards fire retardant PA6 during melt blending was investigated in this work. The residual monomer was collected using solvent extraction method and determined by GC-mass technique. Addition fire retardant additive during polymerization process dramatically affected fire retardant properties, mechanical properties and also reaction between ammonium polyphosphate and HDI were observed. The physical and mechanical properties of the fire retardant PA6 which prepared via melt blending was determined by the following techniques, including tensile, impact tests and fire retardant properties.