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# Synthesis and Study of Thermal Degradation Process of 2,4-Dihydroxyacetophenone-Guanidine-Formaldehyde Copolymer

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**Abstract:** *The resin DAPGF-III, in a molar ratio of 3: 1: 5 was made by heating in the presence of 2M hydrochloric acid for 5h by polycondensation of Guanidine hydrochloride and 2,4-Dihydroxyacetophenone in the presence of formaldehyde. The preliminary structure of the copolymer was evaluated by spectral methods such as elemental analysis, $^1$H-NMR, FTIR and UV-Visible techniques. The molecular weight of the copolymer was determined by non-aqueous conductivity titration performed by using alcoholic KOH. TGA analysis of the synthesized copolymer is carried out by non-isothermal thermogravimetric analysis, where the sample is exposed to continuous temperature rise at a heating rate of 20°C / min in an air atmosphere and is used to study the rate, decomposition and thermal stability analysis of newly synthesized copolymer at which it was executed. Thermal parameters such as apparent entropy (ΔS), frequency factor (A), change in free energy (ΔG), and rate of reaction were determined according to the methods of Freeman Carroll (FC) and Sharp Wentworth (SW). The activation energy measured by the FC method was confirmed by the SW method.*

**Keywords:** Polycondensation, Spectral methods, TGA, Thermokinetic parameters, Guanidine, Synthesis

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