Nucleophilic Substitution Reactions of 2,4-Dinittrophenyl Acetate With Hydrazine and methanol Solvent Effect

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Abstract

The generally accepted mechanism for nucleophilic aromatic substitution (the snare mechanism) is an addition-elimination mechanism and involves the formation of a Meisenheimer type of intermediate. The hydrazinolysis of 2,4-dinitrophenyl acetate in methanol proceeds exclusively through acyl-oxygen scission by a concerted mechanism. The process depends on the basicity of the leaving group and its steric hindrance as well as the possible intramolecular hydrogen bond in the transition state. The reactions of 2,4- Dinittrophenyl Acetate with hydrazine obeyed pseudo-first-order rate constants (k_{obs}). The linearplot of k_{obs} vs. amine concentration indicated that there is no base-catalysis.The large negative $\Delta S^{\#}$ value indicates a rigid transition state or great participation of methanol molecules in the activated complex.

Author Keywords

2,4-Dinittrophenyl Acetate, Methanol Solvent, Hydrazine and Nucleophilic