

**National Conference on Advanced Research in Science,
Engineering, Management and Humanities****(NCARSEMh – 2025)****27th July, 2025, Jharkhand, India.****CERTIFICATE NO : NCARSEMh /2025/ C0725753****A Study of IL-POM Salts' Catalytic Efficiency in Aniline Oxidation****Mohd Vikaruddin Ansari**

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ABSTRACT

Ionic liquid–polyoxometalate (IL–POM) salts have attracted considerable attention as promising catalysts for oxidation reactions because they combine the tunable properties of ionic liquids with the strong redox and catalytic characteristics of polyoxometalates. Aniline oxidation is an important reaction in organic synthesis and industrial chemistry, particularly for the preparation of value-added aromatic compounds. The catalytic efficiency of IL–POM salts can be evaluated by examining their ability to promote aniline oxidation under controlled reaction conditions. Important factors include catalyst composition, reaction temperature, reaction time, oxidant concentration, solvent system, and catalyst loading. The structure and nature of the ionic-liquid cation can influence the accessibility of the POM active sites, mass transfer, substrate interaction, and overall catalytic performance. Polyoxometalate anions can participate in electron-transfer processes during oxidation, while the ionic-liquid component may improve catalyst solubility, stability, and recyclability. Catalytic activity can be assessed through aniline conversion, product selectivity, yield, and catalyst reusability. A systematic comparison of different IL–POM salts can therefore provide valuable information about structure–activity relationships. Such studies may contribute to the development of efficient, selective, recyclable, and environmentally more sustainable catalytic systems for aromatic amine oxidation and related organic transformations.