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Gas phase selective oxidation of chlorotoluene's on vanadium oxide-based catalysts

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Ecofriendly disposal and conversion of persistent chloro-organic pollutants is one of the important issues which pushed the chloro-hydrocarbon chemistry into the focus of considerable debate and research topic. It's known, modified oxovanadium catalysts are widely used in the heterogeneous catalytic oxidation reactions. Moreover, maleic anhydride and its chloro-substituted analogues have wide apply in many industries, such as paints, pharmacy additives etc. The common feature of having one or more covalent bound chlorine atoms, these compounds show a complex diversity of behavior that is primarily characterized by their aromatic character and the presence of other functional groups. Nevertheless, the introduction of chlorine atom(s) into desired products significantly influences its physicochemical and biochemical properties. From this point of view, the present paper is devoted to find a better performing catalyst for the selective oxidation of chloroaromatic hydrocarbons. Catalytic systems based on salt sand oxides of V, Mo, Sb, P were prepared by co-precipitation, impregnation and mechanical-chemical shifting and characterized via Scanning electron microscope, X-ray diffraction, Thermal analysis, N_2 adsorption-desorption methods. Elemental analysis is used to determine quantitative elemental content of catalysts. An analysis of reagent and product composition was carried out using Agilent 7820A GC equipped a flame ionization detector (FID) and Hp5 column. Selective oxidation processes of chlorotoluene's investigated both on a fixed bed and fluid-bed layer of catalyst. Although the process of heterogeneous catalytic oxidation of chlorotoluene's took place with a higher conversion in a fixed bed but it showed higher selectivity fluid-bed layer of catalyst was found.

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