

Comparision of cyclic and polymeric disulfides as catalysts for the regioselective chlorination of phenols

Mohammed B Alshammari

Prince Sattam bin Abdulaziz University, Saudi Arabia

Isomerically pure chlorinated phenols are valuable materials as intermediates for industrial and pharmaceutical chemicals. They are also the primary active ingredients in a range of household and commercial disinfectants. But concerns have increased about the toxic nature and environmental accumulation of some chlorinated phenolic compounds and their potential by-products. Therefore, it is important to develop chlorination catalysts capable of minimizing undesirable waste products. We have previously investigated the use of simple organic sulfides for the catalytic chlorination reaction of phenols using sulfuryl chloride. Unfortunately, volatile examples of such materials are undesirable on an industrial scale because of their odors. The problem of the volatility of such sulfides was mitigated by the use of substituted Merrifield resins and dithia-alkanes, but neither of these reagent types is likely to be useful commercially. Now we report that, two cyclic and two polymeric disulfides have been synthesized and established to be useful catalysts for the chlorination of m-xylenol, o-cresol, m-cresol and phenol using freshly distilled sulfuryl chloride in the presence of aluminum or

ferric chloride as a co-catalyst at room temperature. The yields of para-isomers and para/ortho ratios were higher compared to cases where no catalyst was used with most catalysts for most phenols even when a very low concentration of disulfide was used.

m.alshammari@psau.edu.sa