ABSTRACT BOOK

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A SELECTIVE CONVERSION OF BENZYLIC ALCOHOLS TO THE CORRESPONDING CARBONYL COMPOUNDS BY MEANS OF AN AG(III) AND CU(III) COMPLEXES

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The oxidation of alcohols into aldehydes and ketones is a ubiquitous transformation in organic chemistry and numerous oxidizing agents are available to effect this key reaction. This reaction raises continuous interest, but most of these reactions have not been applied to sensitive natural polyfunctional products. In recent years investigators have been increasingly interested in studies of unusual oxidation states of transition metals such as Cu(III), Ni(III), Ni(IV), Ag(III). We now have looked more closely at the possibility of preparing carbonyl compounds with the aid of Ag(III) and Cu(III) complexes, partly because it is unusual for Ag and Cu species to have charge +3, which means it can easily change charge; partly because complex being easily made of inexpensive chemicals.[1,2]

Investigations have been carried out with some potentially oxidable substrates which contains different type of hydroxyl group in the molecule like D-(-)-*threo*-2-dichloroacetamido-1-(4--nitrophenyl)-1,3-propanediol(chloramphenicol), (1R,2R)-(-)-2--amino-1-(4-nitrophenyl)-1, 3 -propanediol, (S)-1-phenyl- 1, 3 --propanediol and Ag(III) and Cu(III) complexes. The method gives the possibility of selective oxidation of benzylic hydroxyl groups in polyhydroxyl compounds in good yields. Such systems occur in nature and medicine and thus there is considerable interest in devising synthetic methods for their regioselective oxidation.

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KILOGRAM PRODUCTION OF CORANNULENE: OPTIMIZATION AND POTENTIAL APPLICATIONS

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Corannulene was first synthesized in 1966 in 16 steps with less than a 1% yield.[1] This synthesis on milligram-scale, albeit pioneering, was not suitable for preparing enough material for further application. Improvements in the synthesis of corannulene have opened the door for a series of mono-, di-, tetra-, penta-, hexa- and deca- substituted derivatives on gram scale.[2] These derivatives can be used as a template for a variety of higher order structures, such as graphite tubes/caps, liquid crystals, dendrimers, polymers, cruciforms, cyclophanes and molecular clefts. To exploit the materials chemistry of such derivatives, a chemical process for production of corannulene on kilo scale would be advantageous.

An efficient entry process for the synthesis of corannulene has been demonstrated on kilogram scale.[3] Compared to the discovery and gram-scale syntheses, the amounts of solvents and reagents per gram of product were greatly reduced. Priority was given to implement the least toxic agents possible. Improvements in the purification of products obviated the need for column chromatography, alleviating four chromatographic operations. A new reduction method for the final step of the synthesis decreased reaction time from 6 to 0.5 days, and avoided the use of 100 equiv of zinc metal. The process now comprises nine steps, each of which runs smoothly at 100-L scale with a charging of 3–12 kg of educt. A total of 1.3 kg corannulene was isolated. This kilogram-scale process reduces material costs by over 2 orders of magnitude compared to that for the published gram-scale syntheses.

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