SYNTHESIS AND CHARACTERIZATION OF BIOLOGICALLY ACTIVE COORDINATION COMPLEXES/POLYMERS FROM AGRO- BYPRODUCT

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ABSTRACT

Development of polymeric materials from agro-byproduct has been of great economical and ecological significance. Cashew Nut Shell Liquid (CNSL) is an industrial byproduct obtained from the cashew plant Anacardium occidentale L. CNSL consists of a mixture of natural phenols with a side chain of fifteen carbon atoms which contain one, two and three unsaturated bonds and as a major component around 90 % anacardic acid (AA) and 10 % AA-related compounds such as cardanol, cardol and 2-methyl cardol. CNSL is regarded as a versatile and valuable raw material for wide applications such as additives for lubricants, diesel engine fuels, pour point depressants, antioxidants, stabilizers, flame retardants, resins, inks, hydro-repellents, fine chemicals, intermediates as well as biomedical applications.

In the present work we have taken an attempt to synthesize co-ordination complexes/polymers from cheaply available CNSL natural source to evaluate their biological activity by various antimicrobial strains. The synthesis has been carried out by “solid-state in-situ” synthesis. UV-visible, FTIR, 1H-NMR and 13C-NMR spectral techniques have been used to characterize the co-ordination complexes/polymers. TGA and DSC techniques have been used to evaluate their thermal properties. Antimicrobial activity of the co-ordination complexes/polymers has been tested by agar diffusion method against different pathogenic microbial strains to evaluate their potential biomedical applications.

The synthesized complexes show higher lipophilicity and chemical stability, along with higher thermal stability and antimicrobial activities in comparison to virgin ligand. The invention will also solve the problems of high solvent consumption and long reaction for preparing the metal complexes.

Fig. 1: Coordination complexes/polymers from agro- byproduct such as CNSL

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