

# Synthesis and Characterization of Porous Coordination Complex/Polymer from Cashew Nut Shell Liquid (CNSL): A Sustainable Development

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## ABSTRACT

Sustainable resources have been attracted considerable attention in the development of different kind of materials for versatile field of applications due to their non toxic nature, various functionality, environmental concerns as well as depletion of petroleum feed stock. Later problem reflects a global requirement for sustainability without resource exhaustion. Cashew nut shell liquid (CNSL), is an agro byproduct, associated with anacardic acid, cardol, 2- methyl cardol and cardanol. It is a versatile and valuable raw material for wide applications and considered as an alternative resource for the petroleum derived materials. In present work an attempt has been taken to synthesize porous coordination complex/polymer from technical Cashew nut shell liquid (TCNSL, contains 62.86 % Cardanol) with divalent Manganese ions ( $Mn^{2+}$ ) via “solid- state in situ” approach with conventional and microwave-irradiation techniques. The synthesized materials have been characterized by FTIR and UV-Visible spectral techniques. Hydrophilic and hydrophobic behavior of the synthesized coordination complex / polymer has been determined by contact angle measurement. Morphology of the materials has been tested by Optical microscopy, Scanning Electron Microscopy (SEM) and High-resolution transmission electron microscopy (HRTEM) while amorphous or crystalline behaviour determined by XRD techniques. The aforementioned studies reveal that the synthesized complex/polymer is hydrophilic and porous in nature that can increase their application as eco-friendly materials in the field of catalysis, gases and dyes adsorption, targeted drug release etc.

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