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ABSTRACT:

Hyperbranched polymers, a subclass of dendritic polymers possess a globular and a highly branched structure emerging from a central core. These polymers are prepared via solventless, one pot and single step synthesis approach and thus prove to be suitable candidates for paint and coating applications. However, these polymers are mostly synthesised from petro based monomers, which are not preferred from environmental safety point of view. Thus there is a need to develop renewable resource based materials like cellulose, chitin, chitosan, starch and vegetable oils for the synthesis of different types of hyperbranched polymers. Among these, vegetable oils prove to be promising sustainable feedstocks because of their low cost, easy availability and the presence of surface active functional that are prone to various reactions. However, the oil based polymers fail to provide satisfactory performance under stringent environmental conditions that limits their use in various industrial applications. Thus these oil based polymers are modified in the form of interpenetrating networks, hybrids, nanocomposites etc. Nanocomposites are considered as a versatile class of materials and have an immense scope for future research, offering potential scope in the field of paints and coatings. The incorporation of inorganic nanofillers with in the organic matrix can fill the cavities and cause crack

bridging, crack deflection and crack bowing enhancing the integrity and durability of coatings through strong adhesion between coating and metal surface. These nanocomposite coatings exhibited a strong impact on physico-mechanical, thermal and corrosion resistance properties. In view of this, the current thesis describes the synthesis, characterization and anticorrosive applications of vegetable oil based hyperbranched polymer nanocomposite coatings.