PREFACE

In the quest for meeting the ever-increasing demands of polymer science and technology, polyurethane nanocomposites are researched to explore their suitability and utility for myriad applications. Amidst them, fabrication of polyurethane nanocomposites with various carbon based nanomaterials presents good potential for high performance applications, owing to their remarkable and inimitable attributes. Again, modern times have necessitated the idea of "going green" and "sustainability" in scientific research to address the global ecological crisis associated with polymer industry. Therefore, current efforts are devoted in developing eco-friendly, economically viable and industrially potent polyurethane nanocomposites using renewable resource like vegetable oil of castor. There is ample scope for exploration of such renewable resource derived polyurethane nanocomposite using carbon based nanomaterials to ascertain their suitability and tailor their performance for different advanced applications. As such, considering castor oil-modified polyol as a renewable precursor, renewable resource derived hyperbranched polyurethane nanocomposite were developed and their performance investigated. Such nanocomposites are utility materials for various advanced applications, for instances, polyurethane nanocomposite based on graphene oxide and reduced graphene oxide for smart applications like shape memory, self healing and self cleaning; polyurethane nanocomposite based on carbon quantum dots and graphitic carbon nitride for optical and photocatalytic applications.

Therefore, the work presents a renewed approach towards development of eco-friendly high performance renewable resource derived hyperbranched polyurethane nanocomposites with unique properties, with immense potential for different modern applications.

Place: Tezpur University, Tezpur   **(Rajarshi Bayan)**
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