From Cashew Nut Shell Wastes to High Value Chemicals

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Abstract
The amount of waste generated in cashew nut processing factories has caused serious problems for a long time. However, this situation is about to change because they are being turned into an opportunity by a variety of bio-based chemicals. Todate, cashew nut shells (CNS) have proven to be among the most versatile renewable resource as they produce cashew nut shell liquid (CNSL) JU. CNSL which is a dark reddish brown viscous liquid (ca. 30–35 wt%) is extracted from the soft honeycomb of the CNS. The shells have been regarded as a by-product of the cashew industry though now it is a cheaper source of natural unsaturated phenols. CNSL offers a multitude of interesting possibilities for the synthesis of speciality chemicals, high value products and polymers. Our recent research efforts have demonstrated that its constituents can be transformed into diverse functional chemicals. This paper reports some key results on how cashew nut shells (an agro waste from cashew nut processing factories) have been employed to produce several functional materials and chemicals. The materials that are highlighted include the synthesis of 3-propylphenol from cardanol and anacardic acid, some polymers prepared from CNSL components, heterogeneous catalysts prepared using CNSL as a templating agent and anacardic acid capped chalcogenide nanoparticles.