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Conversion of oils into monomers and nanocomposites

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The use of renewable resources in supplementing and/or replacing traditional petrochemical products, through green chemistry, is becoming the focus of research. The utilization of oils can play a primitive role towards sustainable development due to their large scale availability, built-in- functionality, biodegradability and no net CO2 production. Microwaves, being clean, green and environmentally friendly, are emerging as an alternative source for product development. Solvent free conversion of canola oil and fatty acid methyl esters (FAME's) derived from canola oil and waste cooking oil under microwave irradiation demonstrated dramatically enhanced rates. The microwave-assisted reactions lead to the most valuable terminal olefins with enhanced yields, purities and dramatic shortening of reaction times. Various monomers/chemicals were prepared in high yield in very short time. The complete conversions were observed at temperatures as low as 40°C within less than five minutes. The products were characterized by GC-MS, GC-FID and NMR. The ability for complete conversion of oils in just few minutes under solvent free conditions is undoubtedly an attractive concept from both an academic and an industrial point of view. Fatty acid-based monomer was used to prepare hybrid polymer layered silicate nanocomposites by using in-situ polymerizations. The hybrid materials were prepared by adding different ratios of nanoclay during free radical homopolymerization and characterizations were carried out by using X-ray diffraction (XRD), transmission electron microscopy (TEM), atomic force microscopy (AFM), and ATR-FTIR spectroscopy.

Biography

Aman Ullah received his PhD (with distinction) in Chemical Sciences and Technologies in 2010 at the University of Genova, Italy by working together at Southern Methodist University, USA. He is currently working as an Assistant Professor at the Department of Agricultural, Food and Nutritional Science, University of Alberta. He has published more than 20 papers in reputed journals. He was named a Canadian Rising Star in Global Health by Grand Challenges Canada in 2012.

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