Castor Oil as a Future Raw Material for Chemical and Biochemical Industries

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Abstract (300 word limit)

Castor oil is one of the plant products which are considered as renewable resources available in the world. Castor oil comes from the castor oil bean plant, which can be easily cultivated in the weather conditions of tropical and subtropical developing countries such as India, Brazil and Egypt. Castor oil elastomers are prepared by reacting diisocyanate with castor oil in the presence of catalysts. The oil nature of the prepared polyurethane resin produces a polymer with hydrophobic character, reduces swelling effect when used in aqueous media. Polyurethane based on castor oil using waste glass bulb and rice husk which are cheap and available show enhanced mechanical, thermal properties and chemical resistance. These types of composites can be used in oil industry.

Castor oil has wide applications in pharmaceutical industries. Also castor oil can be used in military applications as a plasticizer for rocket propellants. It can be used in colored smoke compositions to increase the energy of activation of colored smoke compositions. Castor oil elastomers are used as binders in plastic bonded explosives (PBX's). The addition of castor oil elastomers increases the stability and safety of PBX's.

Castor oil has been recognized as a competitive feed stock for biodiesel production. Biodiesel production from castor oil has been analyzed by studying the main factors affecting both biodiesel and glycerol yields. The optimum conditions were determined. The physicochemical properties of the produced biodiesel proved good acceptance with EN14214 and ASTMD 6751 biodiesel standards.

As a conclusion castor oil is an excellent precursor for a wide variety of chemical and biochemical industries.

Image



Recent Publications (minimum 5)

1. El-Basuouny Sameh A., **Sadek Mohamed A.**, Wafy Tamer Z.,Mostafa Hosam E(2017) Thermokinetic studies of polyurethanes baseon hydroxyl-terminated polybutadiene prepolymer. JTherm Anal Calorim, DOI 10/1007s 10973-017-6552-5.
2. El-Nowihy G.H., Mohammad A.M., Khalil M.M.H., **Sadek M.A.**, El Deab M.S.(2017)Promising Ethylene Glycol Electro-oxidation at Tailor-designed NiO_x/Pt nanocatalyst. International Journal of Hydrogen Energy, 42(8):5095-5104.
3. El-Nowihy G.H., Mohammad A.M., Khalil M.M.H., **Sadek M.A.**,El-Deab M.S., (2017) Investigating a Sequentially Assembled MnO_x/Pt nanocatalyst as a Potential Anode for Ethylene Glycol Fuel Cells. International Journal of Electrochemical Science.12(1):62-73.
4. Bassyouni M., Sherif Sayed A., **Sadek M.A.**, Ashour F.H. (2012).Synthesis and Characterization of Polyurethane-Treated waste milled light bulbs composites. Composites : part B 43: 1439-144.
5. Sherif S.A., **Sadek M.A.**, Ashour F.H.,Bassyouni M.(2009) Effects Of Surface Treatment Of Ground Rice Husk On Polurethane based On Castor Oil.Polymers & polymer composites, Vol.17,No.8:467-471.



Biography (150 word limit)

Prof. Shahir Sadek earned his B.Sc. in Chemical Engineering in 1971 from Military Technical College (MTC), followed by minimum CSc. in 1977 from Brno Academy (VAAZ) , CSSR.Prof. Shahir earned his Ph.D. in June 1981 from the University of Orsay, Paris, France, in Organic chemistry. He then joined Military Technical College, in Egypt, where he worked as lecturer, associate professor and professor in the Chemical Engineering Branch from 1982 t0 1996. In September 1996 He led the chemical Engineering Department in Higher Technological Institute (HTI)(10th Of Ramadan) till 2004. During this period, he was involved in the establishment of the Chemical Engineering Department, through the development of an up-to-date curriculum. In September 2004, Prof. Shahir was appointed as Associate Dean for October branch of HTI. He continued to lead the branch until August 2010. In September 2010, Prof. Shahir was appointed Associate Dean for Education & student affairs in HTI. In September 2011 he was appointed as Dean of HTI till October 2012. In September 2013 Prof. Shahir Joined the British University in Egypt (BUE) as Head of Chemical Engineering Department. In September 2014 Prof. Shahir was appointed as Vice Dean for Research & Post graduate Studies beside Community Services & Enterprise in faculty of Engineering at BUE till now.

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Notes/Comments: