

Chemistry Africa

Sustainable chemicals: A brief survey of the Furans

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Abstract

Whether it is in the textiles, paints and coatings, energy sector, polymers, plastics, woods, sugar chemistry, pharmacy, aerospace and the automotive industries, the multiplicity of applications of furans and their derivatives, have made steady, impressive, and progressive impacts over the last 9 decades. After World War II, due to the shift in focus towards the petroleum-based chemical feedstocks, research, and development studies of these impressive class of lignocellulosic-derived chemicals, slowed down markedly. The trend, however, has reversed remarkably in recent time, due to the pursuit for “green” and sustainable chemical feedstocks, coupled with the increasing concerns over climate change, volatile oil prices and the attendant undesirable environmental issues, associated with fossil hydrocarbons. Chemicals obtained from “green” inedible lignocellulosic biomass, such as: the furans and their derivatives, ranks amongst the most promising, sustainable, and industrially applicable alternatives to various petroleum-derived chemicals; further offering an enormous assortment of unique compounds/materials, and properties analogous to and even exceeding those derived from fossil hydrocarbons. This article reviews selected progresses, so far made, in the field of furans and its derivatives and their application portfolios; while recognising the immense contributions of Peters and Dunlop, who in no small measures, advanced the furan chemical industry during their research efforts at the Oat Hull Research Centre at the Quaker Oats Company, Cedar Rapids, USA.