Uzoh Chigozie Francolins, J Pet Environ Engineering 2015, 6:5
http://dx.doi.org/10.4172/2157-7463.C1.013

OMICS International
conferenceseries.com

International Conference and Expo on
Oil and Gas

November 16-18, 2015 Dubai, UAE

Kinetics of alkyd polymerization reaction based on statistical optimization paradigm

Uzoh Chigozie Francolins
Nnamdi Azikiwe University, Nigeria

An appropriate kinetic law that governs some important conditions of the reaction process for dehydrated castor monoglyceride (CSO) modified alkyd resin has been developed. A kinetic experiment was conducted following a standard procedure. The classical third order conversion rate model was utilized in determining the rate parameters while the viscosity-conversion model suggested by the free-volume theory was applied for the viscosity kinetics studies. The kinetic model considered for this study adequately predicts the reaction progress even beyond the actual gelation point. The effects of the system parameters on both the predicted yields and the corresponding conversion rates were documented in a well-designed sampling space implemented by statistical screening optimization paradigm. The effects of system parameters on the reaction rates further investigated based on Arrhenius equation detect a heavy mass transfer resistance during the esterification process. A detailed analysis of the response reveals a deviation from linear first order kinetics and possible transition to second and higher order kinetics in the later stages of the esterification reaction.

Biography

Uzoh Chigozie Francolins is currently a PhD student in the Department of Chemical Engineering, Nnamdi Azikiwe University, Nigeria. His research topic is novel approach to synthesize oxy-polymerizable alkyd resin from some inedible non-drying oil for surface coating application. He has published a number of research articles in different ISI-indexed journals. He is a very dynamic and skilled researcher with excellent analytical and problem solving skills and strong aptitude for conducting research related to our current needs. He has demonstrated outstanding strength of character in area of moral rectitude, integrity, tenacity, dedication and capacity for hard work. He is a registered Member of Council for the Regulation of Engineering in Nigeria (COREN); a corporate Member of the Nigerian Society of Chemical Engineers (NSChE); the Nigerian Society of Engineers (NSE) and International Association of Engineers (IAENG). His research and teaching interests are alkyd resins, experimental process design, response surface methods and process dynamics, control and optimization. He has designed many processes for product and process synthesis using design of experiment and statistical screening analysis.

cf.uzoh@unizik.edu.ng

Notes: