conferenceseries.com

J Adv Chem Eng 2018, Volume 8
DOI: 10.4172/2090-4568-C2-009

New click polyesters and poly(ester amide)s via CuAAC based step growth polymerization

David Tugushi, Tengiz Kantaria, Temur Kantaria, Nino Zavradashvili and Ramaz Katsarava
Agricultural University of Georgia, Georgia

The copper(I) catalyzed azide-alkyne cycloaddition (CuAAC) click reaction has already been exploited for the synthesis of end-functionalized polymers, block copolymers, cyclic polymers, dendrimers, cross-linked materials, etc. However, there are only few papers on the application of CuAAC click reaction in Step-Growth Polymerization (SGP) as a chain propagation reaction and surprisingly, there are limited publications on the synthesis of aliphatic triazole-linked AA-BB-type ester polymers by CuAAC click SGP. In the present work we have carried out a systematic study for optimizing the CuAAC click SGP reaction for the synthesis of polyesters in terms of solvent, catalyst, catalyst's activator (ligand), monomers concentration, duration and temperature of various steps of one pot reaction. The established optimal conditions of the CuAAC-based SGP reaction was applied to the synthesis of a series of high-molecular-weight (up to 73,000 Da) 1,2,3-triazole containing click polyesters and poly(ester amide)s which reveals improved thermal properties compared to their regular analogues. The new polymers are promising for practical applications in medicine, agriculture and food industry as biodegradable materials, as environmental friendly biomaterials, etc. The new click polyesters were found suitable for preparing cationic polymers, fabricating biodegradable drug delivery nanocontainers, etc.

d.tughushi@agruni.edu.ge