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Preparation and characterization of meta-aramid copolymersin different diacid chloride composition

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Meta aramid (*m*-aramid) is well known for fire resistant materials belonging to the class of aromatic polyamide polymer that provide outstanding heat and flame resistance, excellent electrical insulation, and good environmental resistance. *M*-aramids have been thus proposed in a wide range of fields including safety/protecting equipment, filtration, and fiber reinforcing composites materials. *M*-aramidcopolymers were synthesized using a low-temperature polycondensation reaction between *m*-phenylene diamine (MPD) and isophthaloyl chloride (IPC) and/orterephthloyl chloride (TPC) in *N*-methylpyrrolidinone (NMP) or *N,N*-dimethylacetamide (DMAc) containing calcium chloride ($CaCl_2$) or lithium chloride (LiCl), repectively. The chemical structure, thermal, and mechanical properties of *m*-aramid copolymers were studied as a function of IPC/TPC ratio and a content of the metal salts.^{1}H-NMR spectra observes that the chemical shifts of all protons agree well with the proposed *m*-aramid copolymer structure. TGA results demonstrate that thermal stabilities of *m*-aramid copolymers largely increase with an increament of TPC content. Furthermore, we will fabricate *m*-aramid copolymer fibers using wet spinning process method, which is based on the systematical study of spinning process to prepare them with excellent thermal and mechanical properties.

Biography

Chan Sol Kang is a doctoral degree student in the group of Prof. Doo Hyun Baik at Chungnam National University, Republic of Korea. He received bachelor degree in 2011 and master degree in 2013 from the same institute. The topic of his doctoral degree is the synthesis and characterization of new high performance polymers containing polybenzoxazoles (PBOs) and aramids, and covers the entire procedure of the structure and property and process correlation of fibers and polymers.

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