Abstract

Recent progress in the field of intrinsically conductive polymers (ICPs) as well as conductive polymer composites (CPCs) filled with natural fibers is reviewed here systematically. The possibilities of utilizing natural fibers as fillers for ICPs as well as CPCs to form natural fibers-conducting polymer composite materials have wide potentials in the modern industries. The unique characteristics such as electrical conductivity, mechanical strength, biodegradability and recyclability enabled them to be implemented in many novel and exciting applications including antennas, chemical sensors, tissue engineering, neural probes, biosensors, drug delivery, bio-actuators, fuel cells etc. The effects of fiber contents, fiber size, chemical treatment, temperature and moisture content on the dielectric properties of the conductive composites were reviewed. On the other hand, it was reported that relatively short natural fibers could modify the dielectric response of the polymeric matrix, but chemical treatment had negative effects on such composites and could decrease the dielectric loss factor.