

Non-leaching antibacterial polymer fabrication using hydrophobic quaternary ammonium salt

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The COVID-19 pandemic is creating chaotic situations around the world that modern society has seen before. Because of this situation, the demand for antibacterial and antiviral materials and products is increasing. QAS(Quaternary Ammonium Salt) is a representative organic antibacterial agent that attacks bacterial cell walls and kills bacteria. In order to improve antimicrobial properties, a bacteriostatic method, which inhibits growth by controlling the surface energy so as to interfere with the adhesion of bacteria, has also been widely used. In this study, the hydrophobic modified QAS was synthesized and then grafted onto the polyethylene to develop a polymer with permanent antibacterial properties. By synthesizing DMAEMA(2-(Dimethylamino)ethyl methacrylate) and Haloalkane, an antibacterial agent having Nitrogen Cation with hydrophobicity was prepared. The produced QAS was grafted onto polyethylene by a radial reaction reaction using a twin extruder. The antibacterial properties of the produced polymer were confirmed using the E. coli.