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**Antibacterial Modification of PET with Quaternary Ammonium Salt and Silver Particles via  
Electron-Beam Irradiation**

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**ABSTRACT**

Quaternary ammonium compound 2-dimethyl-2-hexadecyl-1-methacryloxyethyl ammonium bromide (DEHMA) was synthesized and grafted onto polyester (PET) fibers with acrylic acid (AA) via electron-beam (EB) irradiation process. The grafted fibers were soaked in AgNO<sub>3</sub> solution for further improving antibacterial efficiency. SEM, FTIR, EDX, and XPS were used to characterize the treated PET samples. The antibacterial efficacy testing showed the grafted PET samples inactivated all *Staphylococcus aureus* (*S. aureus*) and *Escherichia coli* (*E. coli* O157:H7) in 10 min. After coated with silver ions, the antibacterial efficacy of the grafted PET with silver against *S. aureus* improved significantly. The EB irradiation process only caused a small degree of the breaking strength loss of the grafted PET fabrics which is acceptable in practical application.

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