

Development of antimicrobial (AgNPs) with gel PP formulation for topical use

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Abstract – Nanotechnology is a multidisciplinary scientific field undergoing explosive development. Silver nanoparticles as an arch product from the field of nanotechnology, has gained interest because of distinctive properties, such as good conductivity, chemical stability, catalytic, antibacterial activity, antifungal, anti-viral, anti-inflammatory. That is well known Ag exhibits potent antibacterial properties with low toxicity for humans and animals by comparison with other heavy metals. The objective of this work is the investigation of the gel formation in modified PP with incorporation of the silver nanoparticles (AgNPs). The modified PP in pellets was synthesized by gamma irradiation of pristine PP under a crosslinking atmosphere of acetylene in dose of 12.5 and 20 kGy, followed by thermal treatment to annihilation of the remaining radicals. The thin gel film of the polypropylene was obtained by extraction in boiling xylene for period of 12 h at 138 °C, followed by decantation in beaker at room temperature of 25°C with the total volatilization of the xylene and deposition of dried material film on glass substrate. The thin film gel formed of modified PP attaché AgNPs was characterized using scanning electron microscopy (SEM), atomic force microscopy (AFM), spectroscopy Fourier transform infrared (FTIR), differential scanning calorimetry (DSC) and cytotoxicity tests including death curve for efficiency evaluation of the silver nanoparticles in those structures.

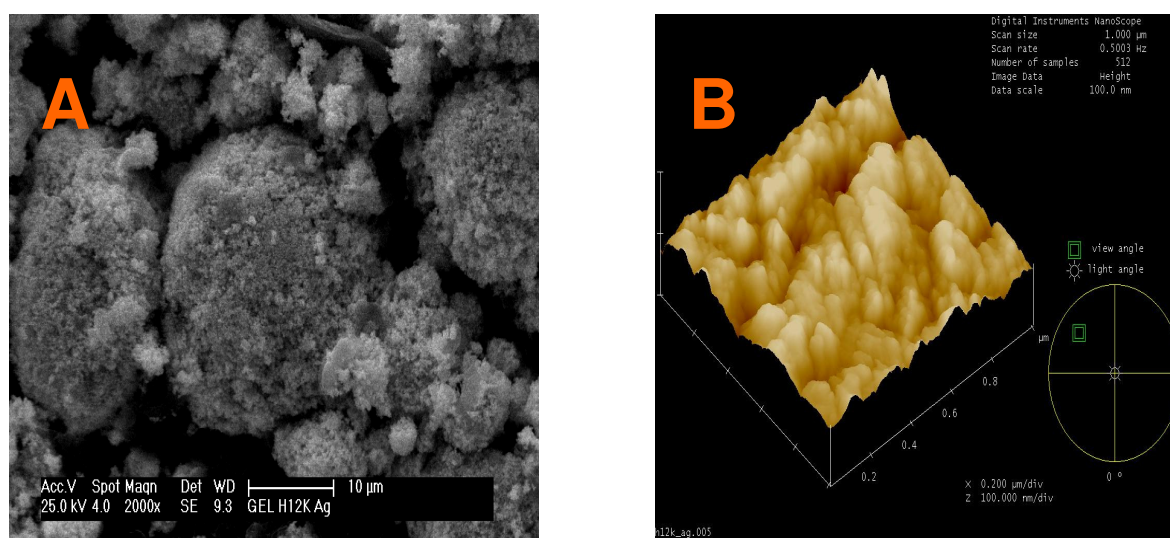


Fig.1 – (A) SEM - microgel of PP modified with 12.5 kGy with AgNPs and (B) AFM 3D AgNPs

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