

Film of the blend of HMSPP/SEBS with TiO₂@Ag for biocide activity against *Candida albicans* and *Aspergillus niger* for medical applications

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One of the most promising ways to overcome the biocide infections on medical materials is the use of metal oxides. The nanoparticle of Titanium Dioxide doped with Silver (TiO₂@Ag) is one of the most promising materials due to the biocide properties against the *Candida albicans* and *Aspergillus niger*. With these observations, in the present work, the nanoparticles of TiO₂@Ag were synthesized by adapting the method of Turkevich [1] and in the sequence, they were incorporated in the polymeric blend of High Melt Strength Polypropylene (HMSPP)[1]/Styrene-Ethylene/Butadiene-Styrene (SEBS). Following that incorporation, it was obtained thin films of 0,3 and 1 %wt concentrations (based in previous results[1]) for characterization tests. The films were evaluated by Biocide tests following the JIS 2801-10 norm with *Candida albicans* ATCC 10231 and *Aspergillus niger* ATCC 6275, X-ray Diffraction (DRX), Raman Spectroscopy. On biocide tests were observed biocide activity of the film with 0,3wt% of TiO₂@Ag showed, in the logarithmic reduction of the bacteria, count upward the standard normalized by the norm (≥ 2), value of 3,24 of logarithmic reduction. In the Raman Spectroscopy and DRX were confirmed the presence of the Ag on the TiO₂: DRX the peak of $\theta = 23,81^\circ$ was attributed to TiO₂@Ag on the film and on Raman Spectroscopy the peak of 1048 cm⁻¹ referred to the NO₃⁻ residual of the silver nitrate, other peaks at 1334 and 1459 cm⁻¹ of the silver indicating the presence in the film [2].

References

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- 2- Al-Shalalfeh, M.M.; Onawole, A.T.; Saleh, T.A.; Al-Saadi, A.A. Materials Science and Engineering C, 76. 356-364. 2017.