

Resumen ponencia n° 123

Development and application of bactericide glass in polymeric compounds: evaluation of bactericide properties

M.A. FIORI^(a), E. ANGIOLETTO^(a), E.C. SANTOS^(a), V. CONTE^(a), J.F. JUNIOR^(a), F.Z. SILVEIRA^(a), H.G. RIELLA^(b)

^a Materials Engineering Department – University of the Extreme South of Santa Catarina (UNESC), Brazil.

^b Chemical Engineering Department – Federal University of Santa Catarina (UFSC), Brazil.

Keywords: ionic exchange, ionic sodium and silver, Master batch, bactericide glass.

Antimicrobial compounds are materials which possess the capacity to inhibit growth or kill determinate microorganisms. The application of this class of materials is quite wide, being used in various products and processes. Throughout the history of mankind, the quest for alternatives to control or eliminate microorganisms that are hazardous to human health presents itself as a vital need to the survival of human beings. For centuries biocide agents have been used for this control, especially for the preservation of water purity (use of copper and silver jars). Food products, development of antimicrobial materials destined to the manufacture of products applied in special environments as well as many others.

According to the application of the antimicrobial materials specific production methods involving the most appropriate antimicrobial agent are utilized. Many of the antimicrobial materials are developed employing compounds as additives, of which silver salts and the compound Triclosan stand out, for their high bactericide efficiency. In this particular work, a bactericide glass rich with ionic sodium and silver was made and applied as an additive in the development of a polymeric compound with bactericide properties. The glass was grinded and submitted to ionic exchange with silver nitrate at a temperature of 430°C, and then prepared to be added to the polymeric compound. The latter was produced utilizing different percents of polypropylene (PP), sodium polyacrilate and glass powder. The mixture was first processed in a single-screw extruder with controlled temperature and screw velocity, being later submitted to characterizations by scanning electron microscopy (SEM) and to standard Agar-Diffusion and Death Curves microbiologic tests. The bacteria used in the microbiologic tests were the *Escherichia coli* (gram negative) and *Staphylococcus aureus* (gram positive). The microbiologic results showed that the bactericide effect of the compound is related to the concentration of the glass and poorly related to the concentration of sodium polyacrilate.

Email addresses: mfi@unesc.net