

MELT FLOW INDEX OF ANTIMICROBIAL COMPOSITES BASED ON MIXTURE OF POLYPROPYLENE/MAGNESIUM HYDROXIDE AND OLIGOPROPYLENE SALICYLIC ACID ESTER*Dostuyeva V. M.*Institute of Polymer Materials of ANAS, Sumgait, Azerbaijan
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Usually, for the comparative characteristics of raw materials and the approximate choice of the method and modes of polymer processing, the melt flow index (MFI) is determined. The purpose of this investigation is to study the effect of the functionalized macromonomer concentration on the melt flow index of the initial mixture of polypropylene/Mg(OH)₂ and composites based on it.

The object of the study was a mixture of polypropylene (PP) and magnesium hydroxide at a ratio of 30/70 and its polymeric compositions with the participation of oligopropylene ester of salicylic acid (OPESA). The use of salicylic acid oligopropylene ester as an antimicrobial additive is due to the fact that low molecular weight antimicrobial additives are gradually washed out from the surface of the product, and therefore the development and use of high molecular weight antimicrobial additives is one of the promising areas.

Polymer compositions based on a mixture of PP/Mg(OH)₂ and oligopropylene ester of salicylic acid were obtained during extrusion on a twin-screw laboratory extruder of the SJZS-10 brand at 160–170 °C.

The MFI of polymeric materials was determined on CEAST MF50 capillary rheometer (INSTRON, Italy) at 190 °C and load of 5.0 kg. The MFI was measured for the melt of the initial mixture of PP/Mg(OH)₂ and melts of its compositions with various mass fractions of oligopropylene ester of salicylic acid at temperature of 190 °C.

Figure 1 shows the dependence of the MFI of composites based on a mixture of PP/Mg(OH)₂ on the concentration of salicylic acid oligopropylene ester. The figure clearly shows that when oligopropylene ester of salicylic acid is loaded into the composition of the composite, a slight increase in the MFI is observed compared to the initial PP/Mg(OH)₂ mixture. With an increase in the concentration of oligopropylene ester of salicylic acid to 3.33 wt. % MFI of the composition is somewhat reduced.

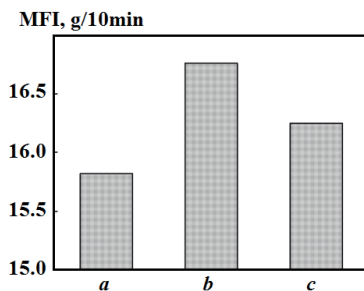


Fig. 1. Dependence of the melt flow index of composites based on a blend of PP/Mg(OH)₂ on the concentration of oligopropylene ester of salicylic acid: a – PP/Mg(OH)₂ (30/70); b – PP/Mg(OH)₂ + 1.66 wt. % OPESA; c – PP/Mg(OH)₂ + 3.33 wt. % OPESA

It can be seen from the MFI data that there is a slight change in the MFR and this, to a certain extent, satisfies the requirements for antimicrobial additives.