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The influence of starch oxidization and aluminate coupling agent on interfacial interaction, rheological behavior, mechanical and thermal properties of poly(propylene carbonate)/starch blends[1] GUO JIANG, SHUI-DONG ZHANG, HAN-XIONG HUANG, School of Mechanical Automotive Engineering, South China University of Technology, THE KEY LABORATORY OF POLYMER PROCESSING ENGINEERING OF THE MINISTRY OF EDUCATION TEAM — Poly(propylene carbonate) (PPC) is a kind of new biodegradable polymer that is synthesized by copolymerization of propylene oxide and carbon dioxide. In this work, PPC end-capped with maleic anhydride (PPCMA)/thermoplastic starch (TPS), PPCMA/thermoplastic oxidized starch (TPOS) and PPCMA/AL-TPOS (TPOS modified by aluminate coupling agent) blends were prepared by melt blending to improve its thermal and mechanical properties. FTIR results showed that there existed hydrogen-bonding interaction between PPCMA and starch. SEM observation revealed that the compatibility between PPCMA and TPOS was improved by the oxidation of starch. The enhanced interfacial interactions between PPCMA and TPOS led to a better performance of PPC blends such as storage modulus (G'), loss modulus (G"), complex viscosity (η^*), tensile strength and thermal properties. Furthermore, the modification of TPOS by aluminate coupling agent (AL) facilitated the dispersion of oxidized starch in PPC matrix, and resulted in increasing the tensile strength and thermal stability.

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