

The polypropylene and hydrophobic cellulose composites

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Owing to the excellent mechanical properties, the composites of polymers and fabrics have drawn much attention as the novel materials from automotive parts to building materials. The cellulose was the polymeric carbohydrate in which D-glucoses were linked through glycosidic bonds leading to the stiff structures of the rods and fibers. As the cellulose fibers were abundant in nature, the polymer composites employing them were cost effective. Even though the cellulose fibers featured the high tensile strength of a few hundred MPa, the hydrophilic character hampered them to be dispersed in the polymeric matrix. To overcome this, we have investigated the simple method to make the cellulose fibers hydrophobic by making use of the surfactants. The surfactants were alkyltrimethylammonium(ATA) chloride salts. When the alkyl chains in ATA featured more than 12 carbons, these surfactants make the cellulose fiber hydrophobic, which was confirmed by the water/toluene extraction. The hydrophobic cellulose was mixed with polypropylene(PP) to afford the cellulose/PP composites.