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Review of the recent developments in cellulose nanocomposite processing

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Abbreviations: A-CNC, acetylated cellulose nanocrystals; AFM, atomic force microscopy; BC, bacterial cellulose; CA, cellulose acetate; CAB, cellulose acetate butyrate; CMC, carboxymethyl cellulose; CNC, cellulose nanocrystals & cellulose nanowhiskers; CNF, cellulose nanofibers & nanofibrillated cellulose & microfibrillated cellulose; B-CNC, tert-butanol cellulose nanocrystals; DMAc, dimethylacetamide; EP, epoxy; GO, graphene oxide; GMA, glycidyl methacrylate; GTA, glycerol triacetate; HPC, hydroxypropyl cellulose; IL, ionic liquid; LDPE, low density polyethylene; LiCl, lithium chloride; LPEG, linear unsaturated polycondensate (oxyethylene); MAPP, maleated polypropylene; MCC, micro crystalline cellulose; MF, melamine formaldehyde; NR, natural rubber; PA6, polyamide; PCL, polycaprolactone, PE, polyethylene; PF, phenol formaldehyde; PAH, polyallylamine hydrochloride; PAN, polyacrylonitrile; PANI, polyaniline; PDMS, polydimethyl siloxane; PEDOT, poly(3,4-ethylenedioxythiophene); PHBV, polyhydroxy butyrate hydroxy valerate; PHO, poly-b-hydroxyoxanoate; PLA, polylactic acid; PP, polypropylene; PS, polystyrene sulfonic acid; PTFE, polytetrafluoroethylene; PVA, polyvinyl alcohol; PVAc, polyvinyl acetate; PVOH, polyvinyl alcohol; PU, polyurethane; SEM, scanning electron microscopy; S-MA, styrene maleic anhydride copolymer; THF, tetrahydrofuran; TS, thermoplastic starch; TEC, triethylene citrate; TEM, transmission electron microscopy; TOC, tempo oxidized cellulose; WF, wood fibers.

Abstract

This review addresses the recent developments of the processing of cellulose nanocomposites, focusing on the most used techniques, including solution casting, melt-processing of thermoplastic cellulose nanocomposites and resin impregnation of cellulose nanopapers using thermoset resins. Important techniques, such as partially

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