

Surface Modified Carbon Black filled Poly Vinyl Alcohol Coating Materials for EMI Shielding

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The electrical conductivity of polymers can be increased by the addition of carbon fillers, such as carbon blacks (CB). Carbon black N330 was surface modified by acid, base and physical activation in CO₂. The surface functional groups could be modified by chemical treatment of the carbon blacks. The electrical conductivity of filler and coating materials increased after the treatments of carbon blacks. The electromagnetic interference (EMI) shielding efficiency (SE) of CB-PVA composites increased from 1 dB to 3 dB after the acid treatment and after the base treatment it increased to 6 dB. The CO₂ activation led to significant increases in the surface area of carbon black N330 which increased from 80 m²/g to 1142 m²/g and the EMI SE of CO₂ activated CB-PVA composites were obviously increased from 1dB to 9.5 dB due to the increased surface area.