Electromagnetic Interference Property of Carbon Black filled PVDF/PVP Composites

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Carbon blacks could be used as the filler for the electromagnetic interference (EMI) shielding. The polyvinylidene fluoride (PVDF) and polyvinylpyrrolidone (PVP) were used as the matrix for the carbon black fillers. Porous carbon blacks were prepared by CO_2 activation. The activation was performed by treating the carbon blacks in CO_2 to different degrees of burn-off. During the activation, the enlargement of pore diameters and development of microporous and mesoporous structures were introduced in the carbon blacks, resulting in an increase of extremely large specific surface areas. The EMI shielding effectiveness (SE) of raw N330 carbon blacks filled with PVDF was about 7 dB and after activation the EMI SE increased to the range from 11 to 15 dB. The variation of the electrical properties of carbon blacks and PVDF/PVP coating materials with different ratios was also studied. With the ratio of PVDF to PVP was 7:3, the composites of carbon blacks filled with polymer mixtures showed much less values of the volume and surface resistivity than other ratios, and higher EMI SE.