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Electric Conductive Dynamically Vulcanized PP-Rubber Blends (TPV) with Nanoscaled Fillers

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The present work has shown a possibility to produce an elastic and electrically conductive polymer material. As the matrix a thermoplastic elastomer based on dynamic vulcanizate was mixed with different types and contents of carbon black (CB). The resistivity behavior of CB filled dynamic vulcanizates was investigated by variation of material and technological parameters. Thanks to the special morphology of dynamic vulcanizates and the nonuniform CB distribution, CB filled dynamic vulcanizates exhibit a low percolation threshold of about 4 wt.% CB. Keeping the CB content low, a broad spectrum of resistivity properties can be achieved by variation of the material factors like type and content of the rubber phase, concentration of cross-linking agent and compatibilizer, and the technological parameters like mixing time and temperature, respectively. In comparison to thermoplastic elastomers on the basis of block copolymers dynamic vulcanizates show a lower percolation threshold. Up to a CB content of about 10 % the mechanical properties of CB filled dynamic vulcanizates are not negative influenced essentially.