ELECTRIC FIELD EFFECT ON THE PERCOLATIVE BEHAVIOR OF SYSTEMS BASED ON POLYETHYLENE GLYCOL AND CARBON NANOTUBES

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S u m m a r y

Thermophysical properties and the percolative behavior of systems based on polyethylene glycol and carbon nanotubes formed under normal conditions and the action of a dc electric field have been studied, by using the differential scanning calorimetry and impedance spectroscopy methods. It is shown that the electric field substantially affect the behavior of nanotubes dispersed in the polymer matrix. Nanotubes are supposed to execute three basic types of motion (rotation, translation, and migration) under the field action, and the corresponding characteristic times are calculated. It is found that the percolation threshold decreases from 0.42% to 0.1% if nanofilled systems are formed in the electric field, which testifies to a substantial alignment of nanotubes in the polymer matrix.