Nanocomposites and nanomaterials

Mechanical stress limits of nanocomposites based on multiwall carbon nanotubes and "KERN-DP" anisotropy automated system

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Even rather small strain can collect up in nanocomposites based on multiwall carbon nanotubes (MWCNT), essentially changing their mechanical characteristics. For measuring diagram σ – ε the modernizing machine "ALA-TOO" (IMASH-20-75) was used. The diagram of strain – deformation σ – ε of nanocomposite based on MWCNT 0,5% + polypropylene is represented on fig. 1.

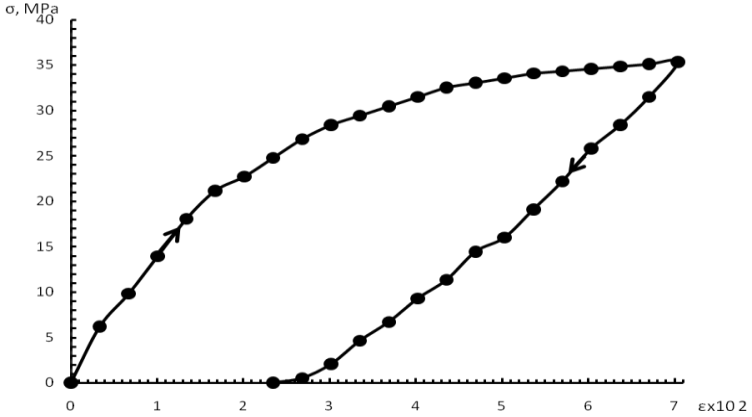

Fig. 1. Diagram of strain – deformation σ – ε of nanocomposite based on multiwall carbon nanotubes 0,5% + polypropylene.

For MWCNT 0,5% + polypropylene the elastic module E ≈ 1,262 GPa, elasticity limit σ_E ≈ 21,15 MPa, inelasticity limit $\sigma_{0.2}$ ≈ 28,37 MPa were. For MWCNT 5% + polypropylene the elastic module E ≈ 1,623 GPa, elasticity limit σ_E ≈ 20,83 MPa, inelasticity limit $\sigma_{0.2}$ ≈ 30,72 MPa, ultimate stress limit σ_S ≈ 40,09 MPa were determined. For MWCNT 0,1% + polypropylene the elastic module E ≈ 0,8942 GPa, elasticity limit σ_E ≈ 18,78 MPa, inelasticity limit $\sigma_{0.2}$ ≈ 21,19 MPa were determined.