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**THE MODELLING OF CARRING OUT OF APPLIED STRESS FROM POLYMER MATRIX TO NANOFILLER IN NANOCOMPOSITES POLYMER/CARBON NANOTUBE**

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**Abstract.** *It has been shown that at certain critical nanofiller contents in nanocomposites polymer/carbon nanotube discrete reduction of carrying out of applied to specimen mechanical stress from polymer matrix to nanofiller happens. Such effect is due to reaching of critical transitions in nanocomposites structure: percolation threshold or formation of closed annular structures of carbon nanotubes. Reaching of the indicated critical nanofiller contents defines reduction (or rate increasing) of nanocomposites mechanical properties.*

**Keywords:** nanocomposite, carbon nanotubes, percolation threshold, closed annular formations, carrying out of mechanical stress, properties.

[1–7].

[8].

[9].

( ) « » 01030 -  
 2,3-3,6 /10 , -  
 ~ (2-3)×10<sup>5</sup> 4,5.  
 ( ) « », -  
 20-70 , 5-10 2 . -  
 ( ) (C<sub>n</sub>H<sub>m</sub>) -  
 Ni/Mg 853-923 .  
 10-80 . -  
 0,25-3,0 .%. -  
 / -  
 Thermo Haake, Reomex RTW 25/42, .  
 463-503 50 / 5 .  
 Test Sample Molding Apparate RR/TS MP  
 Ray-Ran ( ) 503 43 . -  
 11262-2017. -  
 Gotech Testing Machine CT-TCS 2000 ( ), 293 -  
 ~ 2×10<sup>-3</sup> -1.

[9]

$$\frac{\sigma}{\sigma_0} = \frac{1-\phi}{1+2,5\phi} \exp(B\phi), \quad (1)$$

$\sigma$   $\sigma_0$  - ,  $\phi$  -  
 $\phi$  [10]

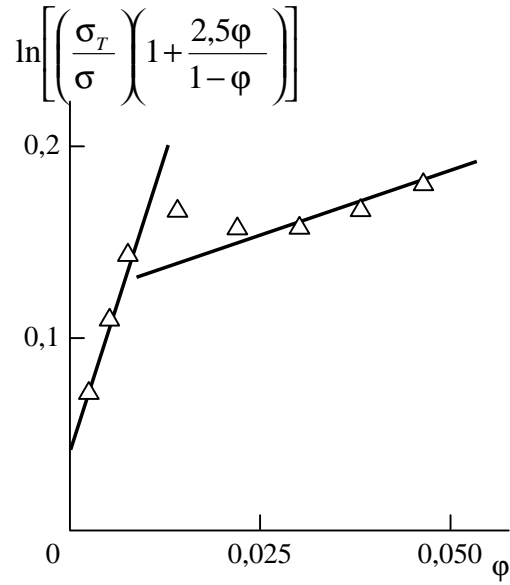
$$\phi = \frac{W}{\rho}, \quad (2)$$

$W$  - ,  $\rho$  -  
 [11]:

$$\rho = 188(D)^{1/3}, \quad / ^3, \quad (3)$$

$D$  -  
 $\ln \left[ \left( \frac{\sigma}{\sigma_0} \right) \left( \frac{1+2,5\phi}{1-\phi} \right) \right] - \phi$ ,  
 (1),

. 1, /  
 $\phi = 0,015$ ,  
 $\phi < 0,015$  = 1,4  $\phi > 0,015$ .



1. 
$$\left(\frac{\sigma}{\sigma}\right)\left(1 + \frac{2.5\phi}{1-\phi}\right) \quad \phi \quad (1),$$

[12],

[13]

$$\phi = \frac{\pi L r^2}{(2R)^3}, \quad (4)$$

$L$   $r$  -

2.  $R$   $(\phi)$   $\phi < 0,015$ .

[14]:

$$R = \frac{L}{2\pi}. \quad (5)$$

(4)

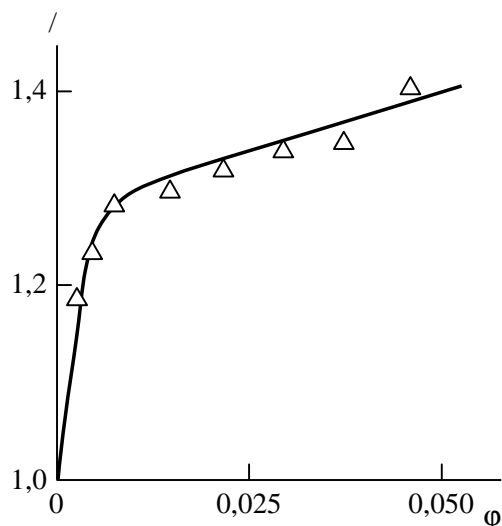
0,0125.

$\phi$

[13]:

$$\phi = \frac{\pi}{12} \left(\frac{D}{2R}\right). \quad (6)$$





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