

CONTENS

N.I.Novokhatskaya, A.N.Tolstun, V.M.Kiiko, A.A.Kolchin, S.T.Mileiko
AN EFFECT OF NON-HOMOGENEOUS FIBRE PACKING
ON MECHANICAL PROPERTIES OF OXIDE/NICKEL COMPOSITES 5

An important aspect of the mechanical behavior of oxide-fibre/nickel-based-matrix composites has been studying, that is an effect of non-homogeneous fibre distribution in a cross-section of the specimen on strength and creep resistance of the composites. A case of the creep resistance is emphasized. It has been shown that a non-homogeneous fibre distribution in composite systems characterized by decreasing the fibre/matrix interface strength at high fibre volume fractions yields a decrease in the composite creep resistance due to a decrease in the interface strength within fibre clusters. For composite systems, in which the interface strength does not depend of fibre volume fraction, a non-homogeneous fibre packing will not yield a decrease in the composite creep resistance (p. 5-17; fig. 7).

I.KH.Badamshin
MODELING OF ELASTIC CHARACTERISTICS OF NANOCOMPOSITES
AND NANOTUBES 18

Possibility of theoretical evaluation of elastic characteristics of nanocomposites and their components CNT/Ni composite being an example composition is shown. Comparison of the results with experimental data is sufficiently good. The method developed can be used in computer simulation to obtain the data for mono- and polycrystals materials(p. 18-23; fig. 3).

P.A.Belov
THE THEORY OF CONTINUUM WITH CONSERVED DISLOCATIONS: GENERALIZATION OF
MINDLIN THEORY 24

In work the model of continuum with fields of conserved dislocations is constructed. The «kinematic» variation principle is used for theory formulation. Unlike the model of Mindlin the account not only curvatures, connected with a gradient of free distortion, but also curvatures, connected with a gradient of constrained distortion is carried out. As result, in the assumption of convertibility of processes of deformation and physical linearity of Hook's law, Euler's equations and a spectrum of boundary problems are constructed (p. 24–38).

L.R.Vishnyakov, S.F.Korablov
CARBON AND CARBON-BASED COMPOSITES OBTAINED
BY HYDROTHERMAL SYNTHESIS (Review) 39

In this review the energy and ecological aspects of the productions of new materials are briefly discussed. An importance of developing low-energy technologies, in particular, hydrothermal synthesis is substantiated. The advantages of solution processes and their applications are described. It is shown that hydrothermal treatment of a biomass in aqueous solutions leads to the formation of various carbon materials with well-developed mesoporosity, including nanostructured carbon. This method gives a simple in one stage, inexpensive, environmentally friendly way to obtain carbon materials from natural sources other than crude oil and natural gas (p. 39-49; fig. 6).

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