CONTENS

S.T.Mileiko, N.I.Novokhatskaya
ON A POSSIBILITY TO MAKE HEAT RESISTANT COMPOSITES OF HIGH GAS CORROSION RESISTANCE BASED ON REFRACTORY METAL MATRIX **5**
Reinforcing a molybdenum matrix with yttrium containing oxide fibres slows down oxidation of molybdenum at elevated and high temperatures. If the fibres are either single crystalline or having eutectic microstructure they determine high creep resistance of the composites at temperatures up to about 1300 °C.
In the paper, a particular example of such composites is considered. An analysis of experimental data on creep rupture and matrix oxidation yields a general idea of tailoring creep resistant refractory-metal-matrix composites of high fracture toughness and sufficiently high gas corrosion resistance. To obtain such composites, we need to reinforce a refractory metal with fibres of high creep resistance, which contain an element providing gas corrosion resistance of the composite. (p. 5-14; fig. 9).

N.N.Golovin, V.S.Zarubin, G.N.Kuvyrkin
ESTIMATION OF EFFECTIVE HEAT CONDUCTIVITY COEFFICIENT OF FULLERENE-MODIFIED COMPOSITE MATERIAL **15**
A Mathematical model of the heat transfer in a fullerene-modified composite material is built up. An effective heat conductivity coefficient of such material is estimated. Dual variational form of stationary heat conductivity process mathematical model for heterogeneous solid is used. An interval for fullerene concentration, in with the estimation obtained are valid is pointed out (p. 15-22; fig. 2)

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CARBON FIBER DANGEROUS DEFECTS IDENTIFICATION USING STATISTICS OF RARE EVENTS **23**
Carbon fibers have high strength and high elastic modulus and are being used as reinforcement in modern composite materials. Strength of carbon fibers is determined by their microstructure and is limited by defectiveness. An analysis of stable distributions yields a method of the evaluation of an effect of various structural defects on the strength of the fibers. This method allows also assessing the effect of mechanical properties at various stages of conversion on the mechanical properties at later stages (p. 23-32; fig. 3).

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SYNTHESIS OF FIBER-FORMING PETROLEUM PITCH BASED ON HEAVY PYROLYSIS RESIN FOR CARBON FIBER **33**
Fiber – forming petroleum pitch based on heavy pyrolysis resin, which is an oil refining industry waste, suitable for carbon fiber production was synthesized for the first time. The requirements for the fiber-forming petroleum pitch have been defined. The synthesized petroleum pitch was studied by modern methods (IR-spectroscopy, elemental analysis, thermal gravimetric analysis, molecular-mass distribution, characteristic softening temperature, filamentation and drop points analysis) (p. 33-40; fig. 5).

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CARBON-CARBON COMPOSITE MODIFIERS **41**
Researchers in GNIIChTEOS have developed impregnating compositions based on carbosilane oligomers and organometallic compounds of zirconium, hafnium and tantalum that can be used for the production of high-temperature oxidation resistant matrices and protective coatings.
Peculiarity of carbon-carbon material modifying by impregnating compositions mentioned is a possibility to introduce silicon carbide and refractory metal precursors (Zr, Hf, Ta) in the carboniferous frame. This allows creating continuous very strong ceramic structures in the bulk of a material (p. 41-52; fig. 9).

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NONDESTRUCTIVE ULTRASONIC CONTROL OF THE THICKNESS OF SiC-COATING ON C/C-COMPOSITES **53**
A technique of nondestructive control of the thickness of SiC-coating on the C/C-SiC-composite surface taking into account the surface roughness of samples was developed. The data obtained by ultrasonic thickness gauging, optical and scanning electron microscopy with EDX-analysis were compared; it was found, that thickness values obtained by the three different methods are equal within limits of the error. It was shown that, decreasing surface roughness leads to a decrease in the error of measurement (p. 53-64; fig. 4).

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