CONTENS

At present, there are many methods for synthesis of nanopowders (NP). The cumulative world production of nanopowders exceeds more than 100 thousand tons per year. The paper presents results of a comparison of NP obtaining methods by productivity rate and powders quality. The powder quality is assumed to be dispersity, presence of impurity and agglomerates. Productivity rate of the method is considered as the mass of powder, which can produced by one unit per 1 hour (p. 5-9; fig. 1).

Numerical and experimental methods for evaluation of transversal shear strength characteristics of wound glass-fabric reinforced plastics were developed for thick-walled bushings of journal bearings. An application of FEA for anisotropic structures with cylindrical symmetry such as bushings of bearings is suitable for finding the stress state and strength of material with the use of information on load and mode of failure.
A vibroacoustic method as NDT for the indirect test of bearing bushing's strength and stiffness without the special sample preparation was developed. Eigenfrequencies are very sensitive to variations in volume fraction of glass fibers, quality of resin curing, presence of delamination cracks, etc. (p.10-18; fig. 7).

At present, the amount of fibre reinforced polymers being used has become one of the major competitive advantages enhancing the advanced aircraft performance unattainable with the use of metals.
Obninsk Research and Production Enterprise «Technologiya» has been engaged in the development, serial production and delivery of high-tech science-intensive products from polymer composite materials for various branches of industry for more than 30 years (p. 19-25; fig. 13).

On the basis of experimental data known and those received in the concerning work the distribution of elements in as-cast multicomponent single-phase high-entropy alloys with BCC crystalline lattice, it is shown by using of electron microprobe X-ray analysis (with resolushion of 2 -4 microns) that the average values of element concentrations in a substitutional solid solution are very close to those of burdening composition. In other words, such alloys after crystallization practically keep conformity to BCC crystal structure and value entropy of mixing, which have been set at their designing. Due to a high value of entropy of mixing of substitutional solid solution, the alloys possess a possibility to preserve the phase structure and a structural state after the subsequent heating, and therefore, mechanical properties up to higher temperatures than multicomponent single-phase BCC-alloys of the same qualitative composition, but in a quantitative ratio they do not correspond to high-entropy alloys, containing one element exceeding 35 - 40 atomic %. (p. 48-64; fig. 4).