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S.A.Firstov, S.T.Mileiko, V.F.Gorban, N.A.Krapivka, E.P.Pechkovsky
ELASTIC MODULUS OF HIGH-ENTROPY SINGLE-PHASE ALLOYS
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A relationship between measured values of the Young's modulus, *E*, calculated values of valence electron concentration, C_{sd}, and measured values of the lattice parameter, *a*, is established for seven cast multicomponent high-entropy equi-atomic alloys with BBC crystalline lattice (BCC-HEAs). If a change in the composition of BCC-HEAs yields an increase in the valence electron concentration C_{sd} then this is normally accompanied by an decrease in the value of *a* and increase in the value of *E*. A reason for the existence of such relationship can be the fact that each of 13 metals, which are used for making the alloys studied, has quite a distinct combination of the values mentioned due to a structure of their electron *d*-zone. The results obtained can be used for a preliminary choice of metals to be mixed while aiming at a particular value of the Young's modulus of the alloy by adjusting the alloy composition. A graphical-analytical method for a choice of the composition of BCC-HEAs with a given value of the Young's modulus is developed (p. 3-17; fig. 5).

V.V.Vasiliev, A.F.Razin, F.K.Sinkovsky
OPTIMAL SHAPE OF A COMPOSITE PRESSURE VESSEL WITH METAL LINER **18**
The paper is concerned with design of metal-composite pressure vessels in which the composite layer is simulated with a monotopic (netting) model of fibrous composite, whereas the metal liner is described by a deformation theory of plasticity. Optimal shape of the vessel is obtained from the condition specifying the minimum level of stresses in the liner. As proved, to satisfy this condition, the vessel should be designed without the metal liner (p. 18-24; fig. 2).

Yury V.Stolyankov, Natalia V.Antufeeva, Alexander E.Raskutin, Svetlana A.Carimova
A POSSIBILITY OF THE DEVELOPMENT OF METAL-POLYMERIC COMPOSITE
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A new stage of the technological development cannot be realized without new structural materials. Composite materials are among new prospective structural materials. One of the promising directions of laminated materials seems to be a combination of the modern fiber reinforces polymer materials (FRPM) with thin layers of amorphous metal alloys. High strength level and corrosion resistance of materials of such kind and their «structure», properties and fabrication process resemblance with FRPM open a possibility todevelop composite materials of a new type (p. 25-31; fig. 5).

Yu.I.Dimitrienko, S.V.Sborschikov, A.A.Prozorovsky, E.A.GubarevaN.O.Yakovlev, V.S.Erasov, V.D.Krylov, M.M.Grigorev, N.N.Fedonyuk
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Fabrication technology of multilayer polymer composite material with discrete structural-orthotropic fillers of honeycomb type on the base of modified vinil-aether binder and is developed with the usage of the infusion method. Physical and mechanical properties of polymer matrix, honeycomb filler, skins of fiberglass and sandwich honeycomb panels were measured. Computer modeling of stress-strain state of sandwich honeycomb panels under four-point bending is conducted. The modeling and experimental investigation show that the bending strength depends on geometrical sizes of the panels. A computer model developed allow predicting elastic-strength properties of multilayer polymer composite material with discrete structural-orthotropic fillers of honeycomb type (p. 32-48; fig. 10).

Khaskov M.A., Grebeneva T.A., Babin A.N.
THE INFLUENCE OF CARBON NANOTUBES ON THE KINETICS OF EPOXY CURING BEFORE
AND AFTER VITRIFICATION **49**
The influence of the multiwalled carbon nanotubes (MWCNT) additives on the kinetics of the epoxy resin curing before and after vitrification is investigated. It is shown, that the presence of MWCNT in the polymer decreases the glass transition temperature (Tg) and changes the dynamics of the glass transition with increasing of the fragility index. The increased fragility and faster physical aging of the MWCNT-epoxy composite below the glass transition temperature (Tg) result in the increasing of the diffusion coefficient at the temperatures higher than the glass transition and the decreasing of it below Tg in comparison with the neat resin, which leads to more rapid curing above Tg and slower curing after vitrification (49-64; fig. 4).

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