

Physico-Chemical nanomaterials science

Defect nanostructure, inelastic anisotropy of SiO₂, hydrogels and automated system “KERN-DP”

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The values of static module E , elastic limit σ_E , effective fluidity limit σ_{fl} , strength limit at compression σ_{st} , internal friction (IF) of the radiation cross-linked hydrogels are determined by the formation of the polyvinyl alcohol molecules nanoclusters. The ionization of hydrogels with thickness layers $h = 2 \div 4 \cdot 10^{-3}$ m was carried out by the relativistic electrons irradiation with energy of $W \approx 1$ MeV [1]. The dependences of efficiency of the radiation cross-linked were investigated after mechanical characteristics from the fluence, dose of irradiation. The cross-linked hydrogels (CLHG) hydrophilicity and gas-penetrability were investigated as the function of them chemical composition and terms of electrons irradiation.

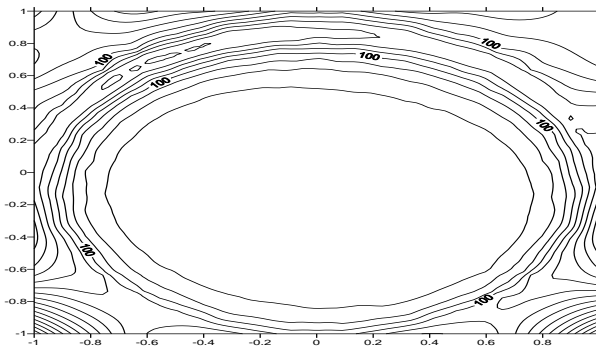


Figure 1 Stereoprojection of isolines of the elastic module E SiO₂

Conclusions

The growth of heights IF maximums Q_M^{-1} testifies the growth of structural defects concentration, and the broadening of IF maximums ΔQ_M^{-1} here represents the relaxation process of structural defects new types in SiO₂.

[1] Onanko A. P., Lyashenko O. V., Vyzhva S. A., et al. Influence of temperature, ultrasound, electrical current on inelastic-elastic characteristics, relaxation processes in Ge-Si and SiO₂ // Sensor electronics and microsystem technologies. – 2011. - vol. **2(8)**, № 3. - P. 14-21.