

Contribution of Nb towards enhancement of glass forming ability and plasticity of Ni-Nb binary metallic glass

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In this present study, effect of Nb content on glass forming ability and plasticity of Ni-Nb metallic glass has been investigated using molecular dynamics simulation with embedded atom method (EAM). Ni-Nb metallic glass specimens having different atomic percentages of Nb content (i.e. ~ 15, 20, 25, 30, 38, 40.5, 45 and 50 at.%) are prepared by fast cooling process (cooling rate $\sim 10^{12} \text{ K s}^{-1}$) from their liquid phase. It is observed that increase in Nb content up till 38 at.% causes improvement of glass forming ability of Ni-Nb binary system. On further increment of Nb content, glass forming ability is found to be slightly reduced or remain almost same. Voronoi cluster analysis has been performed to evaluate the variation in short range ordering with increasing Nb content in Ni-Nb glass. Simulated tensile tests are also performed, and it reveals that higher Nb content actually helps in augmentation of the plastic behavior of the Ni-Nb metallic glass. More in: **Journal of Non-Crystalline Solids**, Publisher: Elsevier, DOI: <https://doi.org/10.1016/j.jnoncrysol.2017.06.007>.

