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Nano-glasses: Non crystalline materials with the controllable atomic structures LOKENDRA KHANAL, WILLIAM ARMOUR, Univ of Idaho, JOHN MCCLOY, Washington State University, YOU QIANG, Univ of Idaho — Crystalline materials were used to make the tools in the Stone Age. Today, crystalline nanomaterials are used in steels, semiconductors, superconductors and ferromagnetic materials etc. because of their controllable micro and nanostructures (defect and chemical). Nano-glasses are the amorphous solids with the controllable nanostructures. They are prepared by consolidating the non-crystalline nanoparticles to have melt quenched glassy structures joined together by the interfacial regions with reduced density, reduced neighbor atoms and different electronic structure than the usual glasses. Nano-glasses can be made to show different properties by controlling the volume to surface ratio at the interface and changing the chemical compositions. Some of the nano-glasses e.g. $Fe_{90}Sc_{10}$ possesses the ferromagnetic behavior unlike the paramagnetic melt quenched glasses. Nano-glasses also have the properties like ductility, biocompatibility and catalytically active. If we could utilize these kinds of unique properties of the nano-glasses, this may lead the nanotechnology to the new era of the materials use. In this, we will report our first try of silicon based nano-glass too.

Lokendra Khanal
Univ of Idaho

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