Glass transition, crystallization kinetics and pressure effect on crystallization of ZrNbCuNiBe bulk metallic glass

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The crystallization of bulk Zr$_{48}$Nb$_{8}$Cu$_{14}$Ni$_{12}$Be$_{18}$ metallic glass has been investigated by differential scanning calorimetry (DSC) and X-ray powder diffraction. The activation energies of glass transition and crystallization for the glass obtained using Kissinger analysis from the shift of the peak temperature in the DSC curve are 470 and 235 kJ/mol, respectively. The effect of applied pressure on crystallization is studied by in situ high-pressure and high-temperature X-ray powder diffraction using synchrotron radiation. It is found that the crystallization temperature increases with pressure having a slope of 9.5 K/GPa in the range of 0-4.4 GPa.

References