



Enhance glass forming ability by increasing the oxygen content level

by Mr. Wang Yinxiao

Date: 08th October 2009 (Thursday)

Time: 12:30pm to 1:00pm

Venue: EA-02-11 (Executive Seminar Room)

Abstract

Bulk metallic glasses (BMGs) have been developed based on a wide variety of metals, including Zr, Fe, Pd, Pt, and Ni. Among these, the Zr-based alloys have had the widest commercial success, and arguably, the best glass forming ability (GFA) of any of the bulk amorphous alloys to date. Oxygen, in particular, strongly affects the GFA of Zr-based alloys. Lin et al. showed that oxygen additions shift the initiation of crystalline phase formation to higher temperatures and shorter initiation time [1]. Others [2–4] have shown how oxygen reduces the GFA and thermal stability of BMGs, and may also lead to precipitation of metastable quasicrystalline phases in the amorphous alloy. In this work, oxygen effect on the GFA of Zr-Cu binary system is studied. Alloys with compositions from Zr₅₂Cu₄₈ to Zr₅₇Cu₄₃ were produced by both crystal and sponge zirconium. We find that the GFA of alloys with crystal Zr in this range is less than 2mm, however, when we use sponge Zr replace crystal Zr, the GFA is increased to 2mm. This effect has never been found before.

Mr. Wang Yinxiao Speaker

Mr. Wang Yinxiao obtained his bachelor's degree in Materials Science and Engineering from Beijing University of Aeronautics and Astronautics (BUAA) in 2008. He is now doing his postgraduate study under the guidance of Professor Li Yi in Department of Materials Science and Engineering, NUS. His research interests focus on the oxygen effect on glass forming ability of bulk metallic glasses.

Dr Xue Jun Min Host

All are Welcome!