

## Cu-Zr 이원계 비정질 합금의 소성과 원자충진률의 관계

박경원<sup>1</sup> · 이창면<sup>1</sup> · Shibutani Yoji<sup>2</sup>, 이재철<sup>1</sup>

### The relationship between the atomic packing density and plasticity of Cu-Zr amorphous alloys

K. W. Park, C. M. Lee, Y. Shibutani, J. C. Lee

#### Abstract

This study examined the structural factors governing the physical and mechanical properties of the amorphous alloys. It was found that these properties are intimately related to the atomic packing density characterized by the atomic-scale structures, as defined by the polygonal short-range ordered (SRO) atomic clusters and the free volume. The Young's modulus, yield strength, and crystallization temperature decreased as the atomic packing density decreased, while the plasticity increased. We report that the origin of the material properties of the amorphous alloys lies in the atomic packing state, which is characterized by the SRO atomic clusters and free volume.

**Key Words** : amorphous alloy, atomic packing density, mechanical and physical properties, short-range ordering

---

1. 고려대학교 신소재공학부

2. 오사카대학교 기계공학과

# 교신저자: 고려대학교 신소재공학부