Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Influence of Nano-Alumina and Micro-Size Copper on Microstructure and Mechanical Properties of Magnesium Alloys AZ31 QUY BAU BOSLEY NGUYEN, SANDAR KHIN TUN, MANOJ GUPTA, National University of Singapore — In this paper, magnesium composites are synthesized through the addition of nano-alumina and micron size copper particulates in AZ31 magnesium alloy using the technique of disintegrated melt deposition. The simultaneous addition of Cu and nano-alumina particulates led to an overall improvement in physical, microstructural characteristics and mechanical response of AZ31. Small size and reasonably distributed second phases were formed. The 0.2% yield strength increased from 180 to 300 MPa (67%), while the ductility increased by almost 24%. The overall tensile properties assessed in terms of work of fracture improved by 66%. An attempt is made to correlate the tensile response of composites with their microstructural characteristics. The results suggest that these alloy composites have significant potential in diverse and wider engineering applications.

Quy Bau Nguyen
National University of Singapore

Date submitted: 14 Oct 2011 Electronic form version 1.4