SCHOOL OF MECHANICAL & MATERIALS ENGINEERING

GRADUATE SEMINAR SERIES

Processing and Mechanical Behavior of Porous Magnesium Composites with High Strength and Low Density

Presented by

Dr. Qizhen Katherine Li

Abstract

Porous magnesium is highly attractive for various applications such as hydrogen storage and biomedical materials. Although the incorporation of pores into dense magnesium leads to attractive properties such as low density, large surface area and high hydrogen storage capability, the formation of porous structure usually deteriorated mechanical properties. Some reinforcing phases were added to the magnesium matrix to improve the mechanical properties. We manufactured porous magnesium–carbon composites with different porosity and different carbon concentration and investigated their mechanical properties, deformation mechanisms, and strengthening mechanisms. The composites with low porosity manifest stretch-dominated deformation, while the composites with high porosity demonstrate bending-dominated deformation. Various theoretical models (i.e. Shear Lag model, Rule of mixture model, Strengthening factor model, and Zhang & Chen model) were utilized to obtain yield strength predictions. The Rule of mixture model, Strengthening factor model, and Zhang & Chen model provided the yield strength predictions that match well with the experimental data for the composites with low carbon concentration. The Shear Lag model and Rule of mixture model provided the yield strength predictions that match well with the experimental data for the composites with high carbon concentration, and load transfer is the dominating strengthening factor.

Biography

Dr. Qizhen Katherine Li is an Associate Professor in the School of Mechanical & Materials Engineering at Washington State University. She received her Ph.D. in Materials Science & Engineering from The Ohio State University in 2004. She has received several awards such as the NSF CAREER Award, TMS/JIM International Scholar Award, TMS Young Leader Professional Award, and Nevada Regents Rising Researcher Award.

Thursday, September 6, 2018
11:00am to Noon

ETRL room 101

Meet the speaker before the seminar in ETRL room 119, 10:30am to 10:50am. Light refreshments will be served.

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