

Title: Study of mechanical and thermal properties of composites reinforced by nanoparticles

Author: Gergely Németh

Department: Department of Physics of Materials

Supervisor: RNDr. Kristián Máthis, Ph.D.

Abstract: In the present work the deformation behavior of magnesium-based alloy AZ31 reinforced by SiC nanoparticles which was produced by horizontal continual casting is studied. Tension tests in the room temperature, compression tests in the temperature range of 20°C-300°C have been performed. Samples were with two different orientations. Deformation strain rate was 10^{-3} s^{-1} . Simultaneously, the acoustic emission is recorded and studied. The mechanisms of plastic deformation of material are discussed mainly in terms of mechanical twinning. Dependence of deformation behavior in compression on temperature is analyzed. The microstructure of original and deformed material is also studied.

Keywords: magnesium alloys, composite material, mechanical twinning, metals with hexagonal structures.