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Effects of Sn on the microstructure and mechanical properties of a hot-extruded Mg-Zn-Y-Sn alloy

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Abstract: Microstructure and mechanical properties of the hot-extruded Mg-1.5 at.% Zn-2.0 at.% Y- x at.% Sn ($x=0, 0.5, 1.0, 2.0$) alloys were investigated. The ultimate tensile strength (UTS), yield strength (YS) and micro-hardness of the alloys reached the peak values in the alloy with 0.5 at.% Sn. The values of the UTS, YS and micro-hardness of the hot-extruded Mg-1.5 at.% Zn-2.0 at.% Y-0.5 at.% Sn alloy were 379 MPa, 230 MPa, and 89.1 HV. It was found that the enhanced mechanical properties in the hot-extruded Mg-1.5 at.% Zn-2.0 at.% Y-0.5 at.% Sn alloy were attributed to the precipitated MgZnY particles with nanoscale size and the uniformed distribution of the LPSO phase.

Keywords: Magnesium alloy; LPSO phase; phase transformation; mechanical properties.

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