Association of Metallurgical Engineers of Serbia

2014, Pages 0-0

Effect Of Impurities On Microstructure And Structural Propertiesof The As-Cast And Treated Al-Zn

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Abstract: The microstructure of two Al-Zn alloys (with 10 and 30 wt.%Zn content) produced by melting in the high frequency induction furnace were investigated by means of scanning electron microscopy (SEM), energy dispersive X-ray (EDX) spectroscopy, X-ray diffraction (XRD) analysisand themicrohardness tests. The results indicate that the presence of iron impurity causes the formation of eutectic (Al,Zn)3Fe in both alloys. The presence of the silicon impurity results in the formation of the phase separation in the Al-10%Zn as-cast alloy. The columnar to equiaxed transition was produced only in the Al-30%Zn as-cast alloy. The Vickers microhardness is higher in the equiaxed zone than in the columnar to equiaxed transition (CET) zone. The presence of iron causes intermetallic phase formation (Al, Fe, Si) 3,6Zn in the Al-30%Zn as-cast alloy enabling an increase in the lattice parameter. After a homogenization treatment, the microstructure of Al-Zn treated alloys consists only of ?dendrites and stable eutectic phase.

Keywords : Al-Zn, HF melting, Dendrites, CET, Impurities, Structural properties.