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Microstructure and mechanical properties at elevated temperature of Mg-Al-Ni alloys prepared through powder metallurgy

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Abstract:

Mg-Al-Ni alloys were prepared by powder metallurgy, and their microstructure and elevated temperature mechanical properties were investigated. Results indicate that, in addition to α-Mg matrix, both coarse Al_3Ni_2 particles and fine AlNi nano-particles exist in the Mg-Al-Ni alloys. The strength at 150 °C is improved with the increase in Ni content. Mg-18.3Al-8Ni alloy possesses a compressive strength of 234.7 MPa and a yield strength of 146.5 MPa. Plasticity is also improved with a low concentration of Ni. Mg-11.3Al-2Ni alloy possesses a compression ratio of 17.3%. The phases of