

Секция 8. Сварка, родственные процессы и технологии для создания технических систем ответственного и специального назначения, в том числе для эксплуатации в экстремальных условиях и низких климатических температур Арктики и Крайнего Севера

DOI: 10.17223/9785946218412/389

FORMATION OF ULTRAFINE-GRAINED STRUCTURE IN AL-MG-MN-ZR SHEETS BY SEVERE PLASTIC DEFORMATION AND SUBSEQUENT ROLLING

Vysotskiy I., Malopheyev S., Mironov S., Kaibyshev R.
Belgorod State University, Belgorod, Russia

The effect of cold rolling and subsequent annealing on microstructure and mechanical properties of ultrafine-grained Al-Mg-Mn-Zr aluminum alloy was studied. The ultrafine-grained structure was produced by equal-channel angular pressing (ECAP) applied at 300 °C to true strain of ~12 and subsequent water quenching. This resulted in fully recrystallized equiaxed structure with an average size ~1 μm. To obtain a sheet semi-product ultrafine-grained alloy was subjected to cold rolling to full hardened condition and stabilized by annealing at 300 °C. The microstructure and mechanical properties of the obtained rolled sheets are studied.

This study was financially supported by the Russian Science Foundation, grant No. 18-79-10174. The authors are grateful to the staff of the Joint Research Center, «Technology and Materials» Belgorod State National Research University for their assistance with the mechanical and structural characterizations.