عنوان مقاله:

Physical and Mechanical Properties Improvement by Different Heat Treatment Cycles on ARBed Nano-Structure Sheet Aluminum

محل انتشار:

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خلاصه مقاله:

Grain atomizing is an effective and economical method to improve the mechanical properties of materials. Process of Accumulative Roll Bonding (ARB) is a way of sever plastic deformation which used for metallic grain atomizing in sub-micron scale without dimensional changes of sheets. In this study, ARB process was done on AL 5083 sheet in 6 cycles (strain of 4.8), then heat treated in different temperatures. Micro structure changes during ARB and after heat treatment was studied by TEM. In order to analyze the mechanical properties of ARB Aluminum sheets before and after heat treatments, mono-axes tensile test and hardnesstest was applied. Also, the analysis of fracture surfaces samples after tensile tests was done by SEM. The results show that changes in micro-structure and dislocation collection starts from 100ºC and the maximum differences and changes of micro structure appears on 200ºC. Furthermore, The tensile and hardness test had the same result as well as micro structure analysis. In addition to, fracture surfaces in different temperatures declared an increase in ductile dimples in accordance with heat treating temperature increase. In this case, in order to obtain the ideal strength and elongation the optimum temperature was 120ºC & grain size was measured about 200 NM.

کلمات کلیدی:

sever plastic deformation, ARB, Aluminum 5083, dimple