

Recrystallization Microstructure Studies of Cold-Rolled Ta_{0.5}Nb_{0.5}Hf_{0.5}ZrTi_{1.5} Non-Equiatomic Refractory High Entropy Alloy

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Abstract : Recrystallization microstructure and grain growth studies of Ta_{0.5}Nb_{0.5}Hf_{0.5}ZrTi_{1.5} refractory high entropy alloy have been explored in the present work. The as-cast Ta_{0.5}Nb_{0.5}Hf_{0.5}ZrTi_{1.5} alloy was cold-rolled to 90% in several passes at room temperature and further subjected to annealing treatment for recrystallization at 800°C, 1000°C, 1250°C, and 1400°C temperatures for one hour. However, the characterization of heavily cold-rolled and annealed condition specimens was done using scanning electron microscopy (SEM-EBSD). The cold-rolled specimens showed the development of an inhomogeneous microstructure. Upon annealing, recrystallized microstructures were achieved; in addition to that, the coarsening of microstructure with raising annealing temperature noticed in the range of 800°C - 1400°C annealed temperatures.

Keywords : refractory high entropy alloys, cold-rolling, recrystallization, microstructure

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