

2018

BEHAVIOURS OF DEFORMATION AND RECRYSTALLIZATION OF 3% SILICON STEEL USING WEDGE-SHAPE SPECIMEN

R. Benchouieb, S. Achouri, W. Ghelloudj, S. TLILI

Abstract : Hot deformation and static recrystallization behaviours of a low carbon 3% Silicon steel, which is ferritic structure at high temperatures, has been investigated using wedge-shape specimen with a single-pass hot rolling experiments. The hot-rolling tests were carried out at temperature of 900°C to 9mm thickness followed by holding at the same temperature (900°C). The volume fraction recrystallized increased with the increase in rolling reduction and holding time after rolling, although a plateau was observed in the relationship between the volume fraction recrystallized and the effective strain. The preferential area for the recrystallization was the previous grain boundaries, particularly triple points of boundaries where the strain was concentrated. An inhomogeneity of recrystallization in the transverse sections through the thickness of the deformed wedges was observed. It was concluded that in this fine grain size material of 3% Silicon steel, the knowledge of deformation and recrystallization behaviors needs better control of strain and temperature under wedge-shape material.

Keywords : 3% Silicon steel, wedge-shape specimen, hot rolling, deformation variables, dynamic recovery, static recovery, static recrystallization.