Abstract

The effect of the aging thermal treatment performed over microalloyed stainless steel X-60 (ASTM A-808) is studied. The thermal treatment has two phases: 1) Solution treatment that consists in introducing the specimens for one hour in the furnace at 1000 ºC and water quenched, 2) Aging process for 1, 3, 5, 7, and 9 minutes at 600 ºC. The microalloyed steel has been evaluated with chemistry analysis, microscopy analysis, tension tests and microhardness tests. Plane specimens for tensile testing were machined from the plating; room temperature tensile tests were done by duplicate in Instrom tensile machine. Metallographic preparations determined that stainless steel was formed by ferrite-perlite phases. The mechanical properties were determined over rolled directions. The tension fracture surfaces are the large populations of shadow voids, and in the samples thermally treated, precipitation was observed. The best result for the mechanical properties was obtained for the condition of 3 minutes. The highest capacity of plastic deformation was determined in the cases of one, five and seven minutes of thermal treatment.

Keywords

Aged, microalloyed steel, thermal treatment