

Nanoindentation analysis of friction stir welded 6061-T6 Al alloy in as-weld and post weld heat treatment

ABSTRACT

In this research indentation instrument testing is used as a new method for local characterization to study different zones of friction stir welded AA6061 alloy. For this purpose nanoindentation and microhardness are applied for samples in as-weld and post weld heat treatment conditions. Nugget zone, thermomechanically affected zone, and heat affected zone are examined by using nanoindenter in both conditions. The observations say that an estimation of the truncated indenter tip defect is necessary because of pile-up. Whereas post weld heat treatment (PWHT) can recover elastic modulus and nanohardness as well as hardness in AA6061 weldment.

Keyword: Friction stir welding; Aluminum alloy; Indentation; Microstructure