

Study of the morphology of oxide scale formed on hot-rolled steel

Adel BALASKA Assia Hamouda, Kamel RAHMANI

Abstract : Mechanism of oxide scales formation on steel during hot rolling process is delicately determined and their structures are extremely complex. This work is part of larger studies made to understand the oxide scale behavior. Therefore, the morphology of oxides is determined by optical microscopy. Identification of the mechanical properties of oxide scales is achieved by micro-hardness measurement. The work has revealed a variation of microstructure in several layers of oxide. It was obtained that the oxide scales consisting mainly of wüstite FeO, magnetite Fe₃O₄ and hematite Fe₂O₃ owing to the formation of voids and cracks in the scales, especially on the outer layer where it is high porous. The intermediate layers is thicker than others oxide layers. The outer layer has a lowest hardness and highest porosity.

Keywords : oxide scales; steel; hardness; metallographic morphology