Corrosion Behavior of Weathering Steel Q450NQR1 and Welded Metal using Flux-Cored Wire in 0.01 mol/L NaHSO₃ Solution

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In this paper, the corrosion behaviors of weathering steel Q450NQR1 and weld metals of solid and flux-cored wires were studied by microstructure observation, electrochemical techniques and scanning electron microscopy. The results show that the microstructure of weld metal using flux-cored wire is mainly consisted of fine acicular ferrite and granular bainite, with some side plate ferrite and polygonal ferrite. The corrosion rate of the weld metal of flux-cored wire is smaller than those of the base metal and the weld metal of solid wire. Although the three specimens have similar corrosion processes in the solution, the composition, generation and evolution of the corrosion product layer play an important role in the corrosion process. The flux-cored wire is a potential and viable weld wire choice for gas metal arc welding.

Keywords: Weathering steel, weld metal, electrochemical techniques, atmospheric corrosion

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