

عنوان مقاله:

بررسی دگرگونی فاز و ساختار منطقه متاثر حرارتی شبیه سازی شده جوش دوپاسه در فولاد میکروآلیاژ X70

محل انتشار:

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خلاصه مقاله:

In multi-pass welding, the heat-affected zone formed in each pass is subjected to another thermal cycle by the next pass. This problem locally changes the microstructure of the heat-affected zone depending on the position of each area relative to the melting line of the next pass, and the overlapping of the heat-affected areas will lead to complex microstructures. In this research, based on the practical conditions of pipe production in the factory, including submerged arc welding with four electrodes in two passes from the inside and outside of the pipe, the thermal cycles of the heat-affected zone were first analyzed. Simulation of thermal cycles of heating and cooling up to the peak temperatures of 950, 1150 and 1350 °C was performed in a dilatometer and the transformation behavior and microscopic structure were studied. Simultaneous modeling of precipitation dissolution and austenite grain growth was done. It was observed that the grain growth reaches a limit in 300 seconds. The main cause of grain growth at temperatures below and above 1150 °C, is the dissolution of fine and coarse deposits of niobium carbonitride, respectively. Also, the modeling of austenite formation and decomposition was done using the classic JMAK equation. It was observed that the parameter n does not depend much on temperature; while parameter k strongly depends on temperature, transformation amount and austenite grain size.

کلمات کلیدی:

pipeline steel, submerge arc welding, dilatometry, phase transformation, heat affected zone
فولاد خط لوله، جوشکاری زیرپودری، دیلاتومتری، دگرگونی فاز، منطقه متاثر حرارتی

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