High temperature corrosion behaviour of Ni based superalloys

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The nickel-based superalloy, INCONEL 740, maintains good microstructural stability to at least 750^{o}C, and exhibits the stress rupture strength no less than 100 MPa at 750^{o}C. This paper presents the results about the Ar-0.2%SO_2 gas corrosion of INCONEL 740. The Ar-0.2%SO_2-gas corrosion tests were performed because structural components were exposed to highly corrosive environments containing both sulfur and oxygen in many branches of modern technologies, such as high-temperature gas turbines, petrochemical units, and coal gasification systems. Thus, the sulfidation- and oxidation-resistance are of considerable industrial interest for practical applications.
In this study, the corrosion performance of INCONEL 740 in an Ar-0.2%SO_2 atmosphere was investigated at 800-1000^{o}C for up to 100 hr. Resistance to sulfur-containing atmospheres is vital in many corrosive environments. In particular, in an SO_2 atmosphere, serious corrosion such as oxidation and sulfidation can occur simultaneously.

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