- The influence of aging on the microstructure and mechanical properties of a Ni-Cr Mo alloy

Nickel based super alloys form a class of high temperature materials which combine several hardening mechanisms providing excellent mechanical and corrosion resistant properties from room temperature up to elevated temperatures. The properties of a material are determined by its chemical composition and microstructure. In nickel-based super alloys besides the size and distribution of hardening intergranular precipitates, the controlling microstructural features include the size and distribution of grains, the size, morphology, distribution and -nature of grain boundary precipitates is very important. In this study, a rolled Ni-Cr Mo alloy with \(0.3\text{mm}\) thickness was used as initial material. The as-received materials were solutionized at a temperature of \(1342\ \degree\text{C}\) and aged in different temperatures and times to obtain appropriate mechanical properties. The results showed tensile strength and microhardness of heat treated samples reached to about \(1654\ \text{Mpa}\) and \(580\ \text{HV}\) after \(16\text{h}\) of aging at \(760\ \degree\text{C}\). Also, the \(\alpha\)-Cr precipitates were determined as the main reason for improving mechanical properties.

Heat treatment; Ni based alloys; Aging; Microstructure; Mechanical properties

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