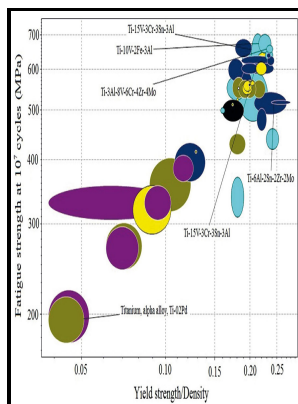


High temperature corrosion of aerospace alloys

AGARD - High Temperature Corrosion



Description: -

-High temperature corrosion of aerospace alloys

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High Temperature Corrosion: Part One :: Total Materia Article

Abstract This book describes a treatment of all forms of high temperature corrosion problems encountered in industry, especially gas turbine and aerospace; heat treating; mineral and metallurgical processing; ceramic, electronic and glass manufacturing; automotive; pulp and paper; waste incineration; fossil fuel power generation; coal gasification; and nuclear.

Leading High

When the oxide layer reforms, a little more of the substrate metal is consumed. For example, heat treat furnaces are often heated by electrical resistance, so that alloys are oxidized by the oxygen in the air.

High temperature corrosion of engineering alloys (Book)

Following this, key degradation and failure mechanisms have been discussed such as, sulfidation, type I and type II hot corrosion, fluxing methods and high temperature corrosion fatigue in metal alloys, primarily nickel-based superalloys for gas turbine engine application.

Material Applications: High

With 1% Cl₂ at 1000 K, the three alloys studied, 1%, 5% and 20% Cr, all showed mass loss over the two hour period of the thermogravimetric experiments due to volatilization of metal chlorides or oxychlorides. Examination of the surface scales by X-ray photoelectron spectroscopy, X-ray diffraction and scanning electron microscopy indicated that, below 640 °C, iron III sulfate was formed and, with Fe₂O₃, constituted the outer layer of the scale.

High Temperature Corrosion

They not only contain a variety of α -stabilizing elements such as aluminum, tin, and zirconium, but also contain a small amount of β isomorphous stabilizing elements such as molybdenum and niobium, and the aluminum equivalent is almost all above 7%. The CFPE for Cr, Mo, and V in octahedral sites in magnetite is high, whereas that for Mn is virtually identical to that of Fe, both of which are very low. This new layer grows inward from the original metal surface, is in intimate contact with the substrate alloy, 39 and has an alloying element composition approximately 1.

High

A few examples of our high-performance alloys follow. It is mainly used to manufacture discs, blades, air intake receivers and aircraft structural parts in compressors.

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