

## Highly Corrosion-Resistant Metal Alloy

Dr. Michael Schöneich und Senol Gezgin

### Introduction

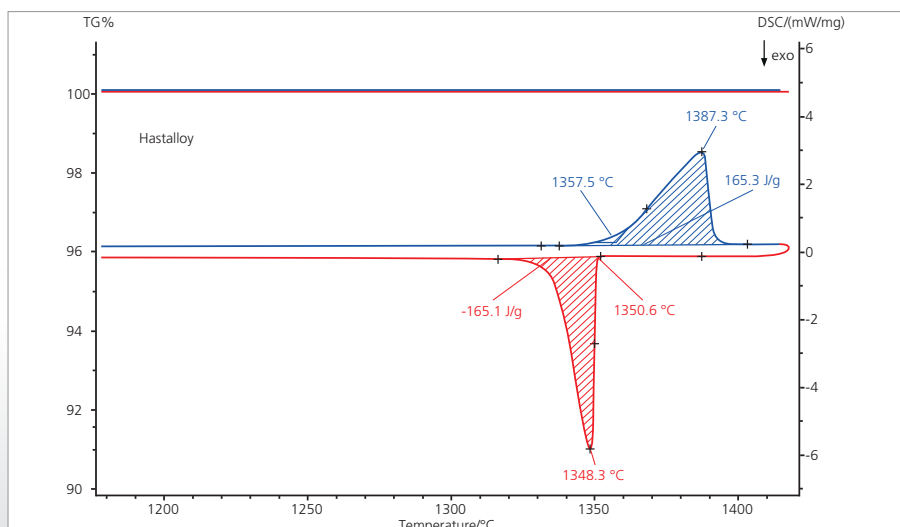
Hastelloy is a nickel-chromium-molybdenum-tungsten alloy with outstanding high-temperature stability as evidenced by high ductility and corrosion resistance. It has excellent resistance to stress-corrosion cracking and to oxidizing atmospheres up to 1038°C. It is used in combustion gas desulfurization plants, chemical industry and incineration plants, etc.

### Measurement Conditions and Results

The STA measurement was carried out between room temperature and 1450°C. The DSC curve (blue) depicts the melting of a hastelloy sample (alloy 22) at 1358°C (extrapolated onset) with an enthalpy of 165 J/g. During cooling, crystallization occurred at 1351°C (extrapolated endset) with nearly the same enthalpy change (red DSC curve). During heating and cooling, neither a mass loss nor an increase due to oxidation was observed (TGA Signals).



1 STA 449 F5 Jupiter®



2 STA measurement on hastelloy (39.02 mg) at heating and cooling rates of 20 K/min in argon atmosphere (70 ml/min); platinum crucibles with alumina liners were used.

### Conclusion

Investigation of the melting and crystallization behavior of metal alloys is possible with the STA 449 F5 Jupiter®. The vacuum-tight design allows for measurements under defined atmospheres improving the test results in terms of repeatability and accuracy. In addition, the risk of misinterpretation of the results due to oxidation effects can be minimized.