

Corrosion Behaviour of Stainless Steels in Molten Nitrate Salt

**P. Kettrakul^{a,*}, N. Kanjanaprayut^{a,b}, P. Treewiriyakitja^{a,b}, S. Joy-A-Ka^c,
T. Siripongsakul^a and P. Promdirek^{a,*}**

*^aHigh-Temperature Corrosion Research Centre, Department of Materials and
Production Technology Engineering, Faculty of Engineering, King Mongkut's
University of Technology North Bangkok, Bangkok, 10800, Thailand*

*^bCorrosion department, TFII, King Mongkut's University of Technology North
Bangkok, Bangkok, 10800, Thailand*

*^cMaterial Properties and Failure Analysis Laboratory, Material Properties Analysis
and Development Centre,*

Thailand Institute of Scientific and Technological, 12120Pathumthani, Thailand

**E-mail address: piyoro.se.p@eng.kmutnb.ac.th*

Keywords: Molten nitrate salt, Hot corrosion, Concentrating solar power, Stainless steel

Due to the most cost-effective renewable electricity technology and plentiful supply, concentrating solar power (CSP) is currently being a new candidate for providing the majority of the renewable energy in Thailand. When the heat transfer fluid (HTF) such as nitrate salt have been used for energy storage, the materials degradation in CSP components is often concerned with hot corrosion in molten salt. The objective of this research is to study the corrosion behaviour of ferritic and austenitic stainless steels such as AISI430 and AISI304 in conventional and modified molten nitrate salt (60%NaNO₃/40%KNO₃+5%NaCl). The physico-chemical and electrochemical characterisations were then investigated. It was found that there was effect of NaCl on the corrosion rate, showing higher corrosion rate. According to the surface morphology and electrochemical results, the mechanism of hot corrosion of stainless steels was further discussed in this research.