Danish Experiences in Biomass Corrosion and Recent Areas of Research

In Denmark, biomass has been implemented in the majority of power plants either by firing biomass alone or co-firing of biomass and fossil fuels/additives. This has resulted in an accumulation of experience over the past two decades both from corrosion testing and also the assessment of failures which has given understanding with respect to alloy selection and corrosion rates at various temperatures. Many laboratory investigations focusing on specific aspects of corrosion in controlled atmospheres have also been undertaken to give improved understanding of corrosion mechanisms. However, there are still areas where further investigations are underway, with respect to both laboratory and field testing. The present focus areas of research include: a) Use of coatings in biomass power plants where the coatings perform differently in different biomass plants depending on fuel mix and temperature b) Importance of understanding the microstructure of component materials and how microstructure evolution with time and temperature can influence corrosion. This paper will recap past experience and highlight some of the results from the new research. Based on the brief review of research in the field, and the research described in detail in this paper, critical unresolved issues and a way forward for the industry is presented.