



Intradeposit changes with time due to temperature gradient – Deposit Sampling Pre-Study

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Background

- Intradeposit alkali chloride transport
 - Changes deposit chemistry and morphology with time



Laboratory experiment

Background

- Intradeposit alkali chloride transport
- Lab data exists but limited data from mills
- **Pre-study to see if possible to obtain mill-samples** and how to analyse their cross sections for profiles



Bench scale - Entrained flow reactor

Mill samples

- Campaign at Rauma mill (15 min)
 - Probe 450°C with removable ring deposit attached
 - After tertiary SH, close to roof, 660 °C
 - SEM: no CI detected
- Deposit from Finnish mill (~2 hours)
 - Probe 300 °C with removable ring deposit attached
 - Before BB
 - SEM: no CI detected
- Deposit from Swedish mill (~2 hours)
 - Carryover probe 450 °C deposit detached
 - Primary SH
 - SEM: CI detected and cross section further analysed

Rauma





No CI detected



No CI detected

Swedish mill



- On average
 0.5-0.8 wt-% Cl
- SEM images further analysed for profiles of CI and other elements

- Traditional: Spot and line analysis
- Tested: Horizontal averages from elemental x-ray maps





Horizontal averages from elemental x-ray maps



Room for method refinement – which pixels contain relevant information?



Conclusions

- Short time (≤ 2 hours) deposit sampling and analysis for the purpose of better understanding deposit aging appears possible
- Corrosion probes have been used in 1 month / 1000 h experiments in RB
 - Corrosion rate determined from ring mass loss deposit has been irrelevant
- Question remains if it is possible to obtain deposit samples on rings after longer exposure times than tested so far
 - Plugging of probe opening

How to proceed?

- Continue method development/testing
 - Goal: to obtain deposit samples from longer runs than so far, say a few days or a one week
 - A "small" project with SKY
- Is there interest from SKY side to finance a MSc thesis
 - Sampling, analysis method refinement, analysis of results
 - Starting earliest 2018