HLWYM HEmails

From: Roberto Pabalan
Sent: Monday, April 09, 2007 5:26 PM
To: Lietai Yang
Cc: Yi-Ming Pan; James Myers; Pavan Shukla; Xihua He
Subject: RE: Review of Deliquescence Corrosion
Attachments: NH4NO3 decomposition.doc

Lietai,

To address #1 on my list, I used StreamAnalyzer 2.0 (vapor fraction-type calculation) to calculate the stability of NaNO3, KNO3, and NaNO3-KNO3 mixtures at 120 C and higher temperatures. No decomposition of NaNO3 or KNO3 was indicated, although convergence was not achieved above a certain vapor fraction. In contrast, the thermodynamic calculation of NH4NO3 salt stability clearly showed decomposition into HNO3(g) and NH3(g) at 120 C. Attached is a file with figures showing the results for NH4NO3 decomposition.

I have found no literature information indicating KNO3 or NaNO3 will decompose to acid gases at elevated temperature.

--Bobby

-----Original Message-----
From: Lietai Yang [mailto:ltyang@cnwra.swri.edu]
Sent: Friday, March 30, 2007 3:17 PM
To: Roberto Pabalan; Pavan Shukla; Xihua He
Cc: 'Yiming Pan'
Subject: Review of Deliquescence Corrosion

All,

Weidentified areas toreview for the DOE deliquescence corrosion FEP screen report in a meetingseveral months ago and I sent out an e-mail requesting forresponsestoo.Below is the inputs I would like to have from the team(seealso the revised file inS:/YPanfolder,Name: Deliquescence Corrosion_Revised_Summary). I would like to have anupdateinthe followingareas:

Bobby:

1) Calculation for the stability of NaCl, NaNO3, and KNO3 in air with or without CO2 using OLI (do we have other mechanisms for degassing?) .
2)Verification for the Quantity of Dust on the Waste Package Surface: 18 mg/cm2 typical to 26 mg/cm2
3) Volume of Brine Generated by Dust Deliquescence: <1.8 µL/cm2.
4) Stability of salts such as akaganeite, FeO(OH,Cl), that can sqequest chloride

Xihua:

1) Stafling effects
2) Limited amount of electrolyte effect on corrosion rates
3) Effect of thin film on corrosion rate

Pavan:

1) Capillary effects. Some calculations/estimation of the wetability of salt solution on metals, dust-materials substrate
2) Analysis of limit cathode on localized corrosion

Please also let me know if you think you can contribute more or you have a problem with the areas listed under your name.

Thank you in advance.

-Lietai

-----Original Message-----
From: Lietai Yang [mailto:ltyang@cnwra.swri.edu]
Sent: Friday, February 09, 2007 10:45 AM
To: 'Yiming Pan'; Roberto Pabalan; Pavan Shukla; Xihua He
Subject: RE: CSPE/ENG1 Weekly Meeting on Thursday (1/18/07), 1:30-3:00pm in A137

All,

I have prepared a file (in S:/YPan folder) that summarizes the action items from the meeting two weeks ago. Please let me know if I missed anything.

Under the Work Planned heading, I have put the potential work we talked about. If your name is there, please identify the work scope and justification.

The file name: Fellow-up Action Items_Deliquescence Corrosion

I would like to have your response by next Tuesday if possible.

Thanks

-Lietai

-----Original Message-----
From: Yiming Pan [mailto:ypan@cnwra.swri.edu]
Sent: Friday, January 26, 2007 1:39 PM
To: Lietai Yang
Cc: CSPE_Group
Subject: RE: CSPE/ENG1 Weekly Meeting on Thursay (1/18/07), 1:30-3:00pm in A137
Importance: High

Lietai,

The major action item we determined at the Thursday meeting is to begin review of DOE documents for screening out localized corrosion by deliquescence. You have agreed to lead this activity and complete within about 1.5 months (say March 9, 2007). ENG1 will focus on questions 3 through 5 in the DOE decision tree (or 6.3 through 6.5 in your presentation). Please prepare a plan to define the scope of review and assignments. The ENG1 staff should give this effort the appropriate priority. Additional coordination with ENG3 staff may be needed to address the first two questions, but should not impact our review activity and schedule. Let me know if you need any clarification.

Thanks,
Yiming

Hearing Identifier: HLW_YuccaMountain_Hold_EX
Email Number: 487

Mail Envelope Properties
(!~!UENERkVCMDkAAQACAAAAAAAAAAAAAAAAABgAAAAAAAAA3KD4jl3P0xGCOQBgCJBcRcKAAA
AQAAAAsXoXcDWRr0yfVEmgjZB38AEAAAAA)

Subject: RE: Review of Deliquescence Corrosion
Sent Date: 4/9/2007 5:25:52 PM
Received Date: 4/9/2007 5:25:53 PM
From: Roberto Pabalan

Created By: rpabalan@cnwra.swri.edu

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Files	**Size**	**Date & Time**
MESSAGE	4101	4/9/2007 5:25:53 PM
NH4NO3 decomposition.doc	60480	

Options
Priority: Standard
Return Notification: No
Reply Requested: Yes
Sensitivity: Normal
Expiration Date:
Recipients Received:

April 9, 2007

The decomposition of NH4NO3 salt was calculated at 120 C using StreamAnalyzer 2.0. Used vapor fraction calculation. The results are plotted below for the products NH3(g) and HNO3(g) as mole fraction (HNO3 or NH3 divided by initial moles of NH4NO3), as a function of vapor fraction.