HLWYM HEmails

From: Ning Ping Lu [ningping@lanl.gov]
Sent: Sunday, July 01, 2001 9:41 PM
To: dpickett@swri.edu; vdc@avat09.ce.kth.se
Subject: RE: Pu colloid sorption data
Attachments: Table of Pu sorb.LA-UR-00-5121; Tables of Pu Sorb.LA-UR-98-3057

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Dear Dr. Vladimi Cvetkovic and Dr. David Pickett:

I should make an apology to you for not make a quick response to you e-mail dated June15 and June 27. I have been so busy for research on transport of Pu-239-loaded montmorillonite colloids through allivium columns for Yucca Mountain project and Pu(VI)-239 intracts with magnesium oxide backfill for WIPP.

Attached files are 1) the percentage of Pu (V) sorbed on to hematite, montmorillonite and silica, which were the data used in Figure 1 of LA_UR-00-5121. 2) the percentage of Pu(V) and Pu(IV) sorbed onto smectite and silica colloid. You can find these data in the LANL report of
LA-UR-98-3057 " Reversibility of Sorption of Plutonium-239 onto Colloids of Hematite, Goethite, Smectite, and Silic". You may search LANL web:
http://lib-www.lanl.gov/la-pubs/00412991.pdf . In the tables, I gave the uncertainties and I have wrote down an equation for calculating standard devation of mean as statistic error to be reported. I hope this may help you.

Best regards

Ningping

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Subject: RE: Pu colloid sorption data
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From: Ning Ping Lu

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Files	**Size**	**Date & Time**
MESSAGE	1261	7/1/2001 10:10:48 PM
Table of Pu sorb.LA-UR-00-5121	25284	
Tables of Pu Sorb.LA-UR-98-3057	26820	

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Percentage of Pu(V)-239 Sorbed onto Colloids of Hematite, Montmorillonite, and Silica PST-1 as a Function of Time in Natural and Synthetic Groundwater (colloidal concentrations of 200 mg/L)

Time (hr)	Hematite J13 (%)	Hematite SYN.J13 (%)	Ca-Montmorillonite J13 (%)	Ca-Montmorillonite SYN.J13 (%)	Si.PST-1 J13 (%)	Si.PST-1 SYN.J13 (%)
1	46.0 ± 0.3	95.7 ± 0.1	3.7 ± 0.3	3.8 ± 0.4	2.0 ± 0.1	51.2 ± 0.9
4	68.5 ± 1.1	95.7 ± 0.2	7.1 ± 2.3	3.9 ± 1.0	19.2 ± 12.3	56.5 ± 1.1
24	79.8 ± 1.0	96.2 ± 0.4	12.6 ± 1.1	15.7 ± 3.5	49.3 ± 0.6	62.7 ± 1.1
48	92.7 ± 0.6	96.8 ± 0.0	14.8 ± 0.4	17.5 ± 0.3	49.8 ± 0.6	63.9 ± 1.3
96	94.3 ± 1.0	99.2 ± 0.0	41.4 ± 4.2	22.5 ± 0.9	54.6 ± 0.1	66.2 ± 0.1
240	95.1 ± 0.1	95.2 ± 1.0	49.0 ± 4.9	50.6 ± 9.8	58.1 ± 0.3	68.1 ± 9.4

Note: Calculation of standard deviations of the mean: X(mean) $\pm$ $t_{0.5}$*Sy = X(mean) $\pm$ 0.765Sy, where Sy = $(S^2/n)^{1/2}$, n = sample number, and $S^2 = [\sum y_i^2 - ((\sum y_i)^2/n)]/(n-1)$.

TABLE 1. Percentage of Pu-239 sorbed onto smectite colloids as a function of time in natural and synthetic groundwater (colloidal concentrations of ~1 g/L)

Time hr	J.13 Pu(V) (%)	SYN.J.13 Pu(V) (%)	J.13 Pu(IV) (%)	SYN.J.13 Pu(IV) (%)
1	55.3 ± 0.6	53.6 ± 0.0	73.2 ± 0.1	98.8 ± 0.05
4	63.7 ± 0.2	69.6 ± 0.5	85.6 ± 0.1	99.6 ± 0.05
24	80.9 ± 0.0	87.3 ± 0.2	82.9 ± 0.1	99.3 ± 0.08
48	83.8 ± 1.1	91.4 ± 0.6	77.2 ± 0.3	99.4 ± 0.05
96	86.0 ± 0.8	95.4 ± 0.7	78.3 ± 0.6	99.2 ± 0.0
240	89.9 ± 0.3	97.4 ± 0.05	76.6 ± 0.9	99.3 ± 0.05

TABLE 2. Percentage of Pu-239 sorbed onto silica PST-1 colloids as a function of time in natural and synthetic groundwater (colloidal concentrations of ~1 g/L)

time hr	J.13 Pu(V) (%)	SYN.J.13 Pu(V) (%)	J.13 Pu(IV) (%)	SYN.J.13 Pu(IV) (%)
1	18.9 ± 0.5	16.9 ± 1.3	69.2 ± 2.6	76.1 ± 2.0
4	30.0 ± 2.8	23.2 ± 1.0	74.9 ± 3.2	77.7 ± 1.0
24	36.4 ± 1.1	29.3 ± 0.6	74.9 ± 0.9	85.9 ± 0.2
48	43.1 ± 0.9	46.0 ± 0.4	75.7 ± 0.9	88.8 ± 0.3
96	58.0 ± 0.3	63.1 ± 1.7	77.9 ± 0.1	92.6 ± 1.1
240	62.0 ± 0.1	63.7 ± 0.4	77.5 ± 0.1	93.4 ± 0.2

Note: Calculation of standard deviations of the mean: X(mean) $\pm$ $t_{0.5}$*Sy = X(mean) $\pm$ 0.765Sy, where Sy = $(S^2/n)^{1/2}$, n = sample number, and $S^2 = [\sum y_i^2 - ((\sum y_i)^2/n)]/(n-1)$.