HLWYM HEmails

From: Bret Leslie
Sent: Sunday, September 10, 2000 4:51 PM
To: dpickett@gargol.cnwra.swri.edu; pbertetti@gargol.cnwra.swri.edu
Cc: epearcy@gargol.cnwra.swri.edu
Subject: prepping for nopal fluid sampling

Paul and David,

As per my discussion with paul last week here is some more guidance. I mentioned that it would be great if we were ready to sample and measure ra isotopes (Ra223,224,226,and 228) and radon. (I don't know whether LANL is intending to measure the shorter-lived isotopes; David should find out what they intend to sample and measure)

For radium water samples the idea is to capture ra in the field, process the sample at Swri and run by gamma spec as soon as possible (ra-224 has ~ 3 day half life).

The basics are that MnO2 quantitatively scavenges Ra. Because ra isotopes will likely be somewhat low in activity this would require a large volume of water. To get around this if you use a in-line water filter as one would use in your home, available at places like home depot, and impregnate it with MnO2 then you can capture the ra from a large volume and transport it home compactly for analysis.

You will need to have (please order if you don't akready have)
1) 4 L glass beaker to use for loading Mn onto the filters (there are around 12 inches long)
2) KMnO4 (potassium permanganate)
3) Hydroxlyamine hydrochloride
4) HCl
5) Ba(NO3)2
6) H2SO4
7) In line filter (polypropylene not paper!) and tubing (I will provide more details after I am back from Vegas

I will be getting exact recipe and directions this next week, but the basics are dissolve KMnO4 in DIW and soak the filter in the solution for a day. The Mn will precipitate onto filter and you are ready when the filter is dark brown to black. After ppt of MnO2 is complete then rinse filter with DIW until clear. Store filter in plastic bag and take to field.

Field sampling (we need to get details from LANL on how they plan on sampling water eg pump, bailer, lifting casing?). The idea would be to pass ~ 100 liters through filter. This may require buying a plastic garbage can in Mexico (it could be acid washed and filled). Then draining the h20 through the filter at a rate of 500 ml - 1000 ml/minute. Once sampled repack filter into plastic bag and transport home (need to note time of sampling, beginning and ending)

At Swri, put filter back into 4 Liter beaker and diluted (4 M? HCl) acid, hydroxylamine solution is added to beaker and temp raised to 90 oC. The solution will dissolve MnO2 in 1-2 hours.

Once dissolved the Ra is quantitatively precipitated as BaSO4 by adding 5 ml of a saturated Ba(NO3)2 and 10 ml of 20% H2SO4.

Then filter and count by gamma spec.

Paul any progress on Rn procedure by LSA? I haven't gotten a chance to go to library for procedure yet.
Cheers,
Bret

PS I'll give you a call sometime this week to find out the latest.

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