CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES ADMINISTRATIVE PROCEDURE	Proc. TOP-021 Revision 0 Page 1 of 5

Title TOP-021 LEACHING TEST FOR CRUSHED GLASS SAMPLES

EFFECTIVITY AND APPROVAL

Revision 0 of this procedure became effective on ~~1/31/92~~ 2/7/92 BEM. This procedure consists of the pages and changes listed below.

Page No.	Change	Date Effective
ALL	0	~~1/31/92~~ 2/7/92 BEM

SUPERSEDED

Supercedes Procedure No. None

Approvals

Written By Hersh K. Manaktala	Date 2/5/92	Technical Review Gustavo A. Cragnolino	Date 2/4/92
Quality Assurance Bruce Mabrito	Date 2/7/92	Cognizant Director Wesley C. Patrick	Date 2/7/92

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TOP-021 LEACHING TEST FOR CRUSHED GLASS SAMPLES

1. PURPOSE

The purpose of this procedure is to describe the method to be utilized for conducting a leaching test on glass samples. This procedure is applicable for vessels to be used for leaching **non-radioactive** samples, and establishes controls required by CQAM Section 3, "Scientific Investigations and Analysis Control."

2. RESPONSIBILITY

2.1 The Principal Investigator of the project and personnel involved in conducting the leaching test shall be responsible for the implementation and control of this procedure.

3. EQUIPMENT & SUPPLIES

The following equipment or equivalent (as determined by the Principal Investigator) is required for implementing the procedure.

Qty.	Equipment	Manufacturer	Model No.	Calibration Required
3	Balance	Mettler	AE240/AT400/PM4600	Yes
1	Oven	Blue-M	Stabil-Term OV-490A, OV-490A-3	Yes
1	pH Meter, mini-electrode	Fisher/Orion		Yes
2	Pipettes	Eppendorf	0.5-10 ml and 2-10 ml	Yes
	Thermometers	Various	-20 to 150°C, ±1°C	Yes
	Syringes	Becton Dickinson	20 ml	No
	Syringe Filters	Corning	0.45 μm cellulose acetate	No
	Racks for holding leaching vessels	SwRI		No

Qty.	Equipment	Manufacturer	Model No.	Calibration Required
1	Versa-Bath-S	Fisher Scientific	Model-236	No
	Sand/glass bead bath			No

4. PROCEDURE

4.1 Loading the Leaching Vessels

4.1.1 Prepare glass samples as described in TOP-019, and select 100-200 mesh size powder.

4.1.2 Weigh the required amount of glass, generally 1 to 5 g $\pm$10 mg per instructions of the Principal Investigator, with an analytical balance.

4.1.3 Clean the leaching vessel as described in TOP-020.

4.1.4 Weigh the empty leaching vessel with and without the teflon washer and lid, and record the weights.

4.1.5 Transfer glass sample into the leaching vessel and weigh, and record the weighing again.

4.1.6 Add the required volume of deionized (DI) water, generally equal to (mass of sample in g) x 10 ml $\pm$ 0.5 ml as per instructions of the Principal Investigator, using a calibrated pipette.

4.1.7 Seal the leaching vessel using proper tightening wrenches/tools.

4.1.8 Weigh the sealed, loaded leaching vessel and record the weight.

4.1.9 Prepare additional leaching vessels using similar procedures as described in steps 4.1.2 through 4.1.8 above.

4.1.10 A minimum of triplicate samples are to be included in the test for each test condition/environment.

4.1.11 Prepare 3 blanks (controls) as described above without introducing the powdered glass samples.

4.2 Leaching Test Set-up

4.2.1 Place all leaching vessels vertically in an air oven with a circulation fan or into a sand/glass bead bath in an oven, or a partial/full immersion water/oil bath, preheated to the appropriate test temperature per instructions of the Principal Investigator.

4.2.2 After one day, remove the leaching vessels, clean them on the external surface with a clean lint-free cotton cloth to remove any sand/glass bead particles, and weigh the leaching vessels again. Return the leaching vessels to the oven, or water/oil bath as applicable, if the weight loss is less than 5% of the total weight of the initial amount of leachant, otherwise discontinue the test and prepare the test samples again.

4.2.3 Repeat the procedure specified in step 4.2.2 above at the end of 7 days, and again at the end of the test duration.

4.3 Sampling of the Leachate

4.3.1 At the end of the specified test intervals, as per instructions of the Principal Investigator, sample the leachate as follows.

4.3.2 Remove the leaching vessel from the oven, clean the external surface with a clean lint-free cloth, and weigh again. Record the weight in a data entry record.

4.3.3 Unscrew the lid using a proper wrench/tool.

4.3.4 Remove about 4 ml of leachate from each leaching vessel using a polypropylene syringe. Filter the leachate through the 0.45 μm filter into a clean vial.

4.3.5 Pipette 1 ml of the sampled leachate to a vial prefilled with 20 ml DI water and label appropriately for analysis.

4.3.6 Pour remaining 3 ml of the sampled leachate into a 4 ml plastic cup placed in a water bath at room temperature and measure pH. Record measurement in the project Scientific Notebook.

4.3.7 Transfer the samples to the analytical laboratory for analysis per instructions of the Principal Investigator.

4.3.8 Remove all glass particles from the leaching vessels by filling the vessels with water and emptying it as many times as necessary.

4.3.9 Clean the leaching vessels and prepare them for the next series of tests using the procedure described in TOP-020.

5. RECORDS/DATA RETENTION

Data generated as a result of this procedure shall be recorded in a Scientific Notebook in accordance with QAP-001. The QAP-001 specifies QA records maintenance and retention for Scientific Notebooks.

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Title **LEACHING TEST FOR CRUSHED GLASS SAMPLES**

EFFECTIVITY

Revision 1 of this procedure makes this procedure obsolete. This procedure consists of the pages and changes listed below.

Page No.	Change No.	Date Effective
1	0	12/11/2000

Note: This procedure, TOP-021, has been replaced by an ASTM Test Method C 1285-97.

Please remove and destroy the referenced procedure in your notebook/holder and return the acknowledgment page to CNWRA Document Control with your signature and date.

SUPERSEDED

Supersedes Procedure No. N/A

Approvals			
Written by Vijay Jain	Date 12/11/00	Technical Review Gustavo Cragnolino	Date 12/11/2000
Quality Assurance Bruce Mabrito	Date 12/11/2000	Cognizant Director for Budhi Sagar	Date 12/12/2000

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