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N. King Stablein
NTS Project Section
Repository Projects Branch
Division of Waste Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Transmittal of NNWSI/NRC Waste Package Meeting Vugraphs by John Bates

Dear King:

Enclosed you will find a copy of the vugraphs used by John Bates (Argonne National Laboratory) during the NNWSI/NRC Waste Package Meeting of 25 July 1985. These were recently sent to us by John. You now have a complete packet of all the vugraph presentations made at that time.

Yours truly,

Lynden B. Ballou
Waste Package Task Leader
Nuclear Waste Management

LBB/bb

Enclosures

cc: V. Witherill
L. Ramspott
L. Hansen
M. Glora

ATTACHMENT:

# NNWSI Waste Form Test Development

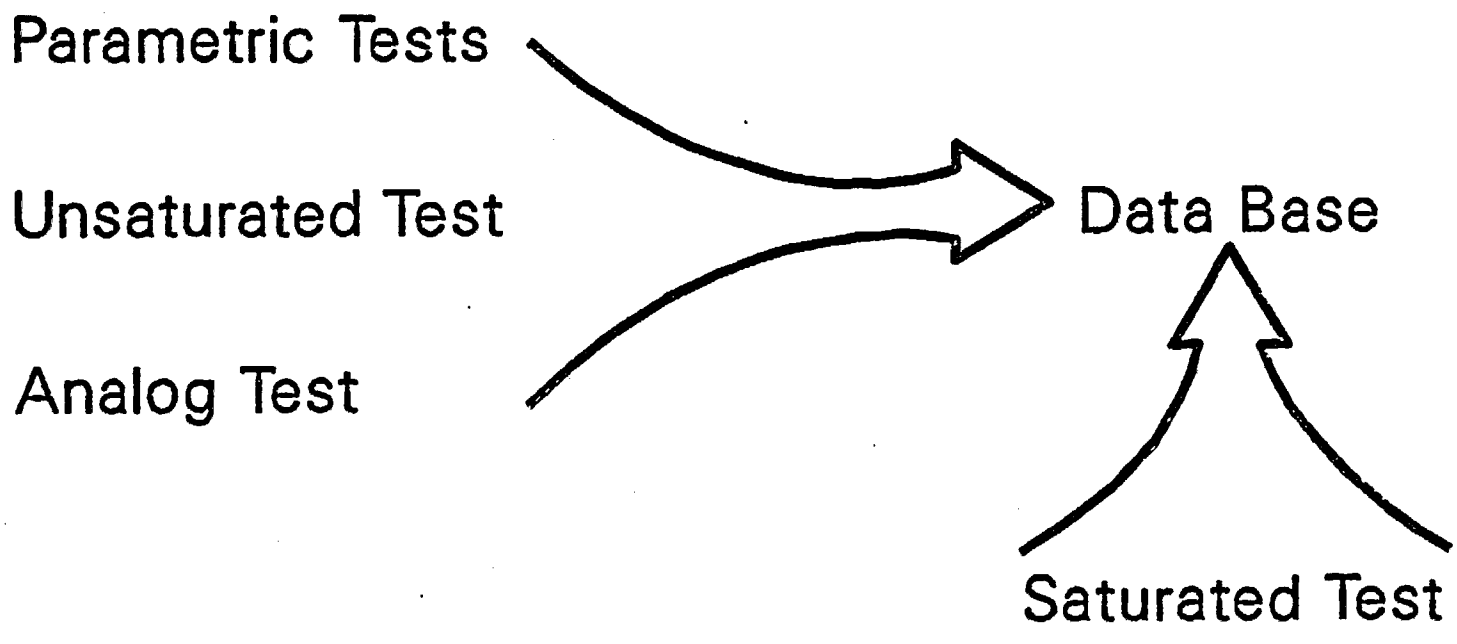
presented to the

NNWSI/NRC Workshop

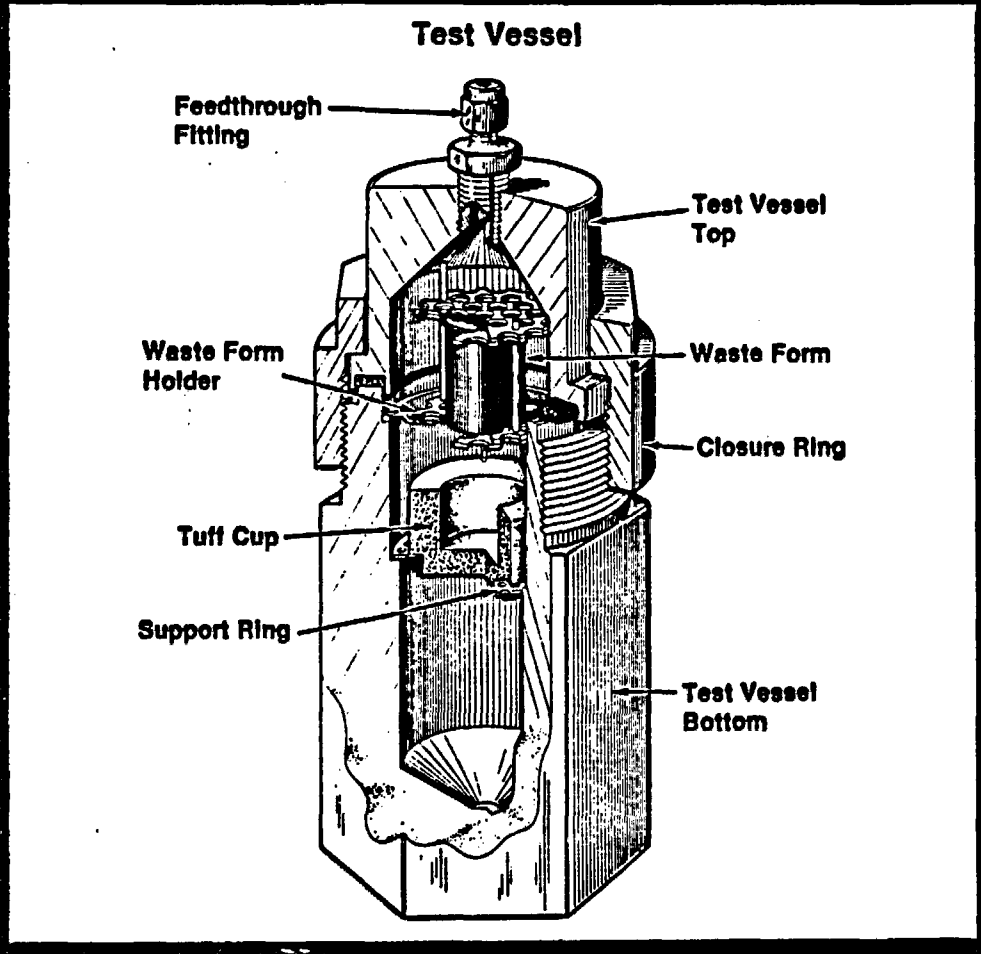
by

John Bates of Argonne National Laboratory

# NNWSI Needs to Assess and Model Repository Behavior During the Isolation Period



The test stresses the importance of interactions and the design, purposefully, does not attempt to model a specific waste package design.



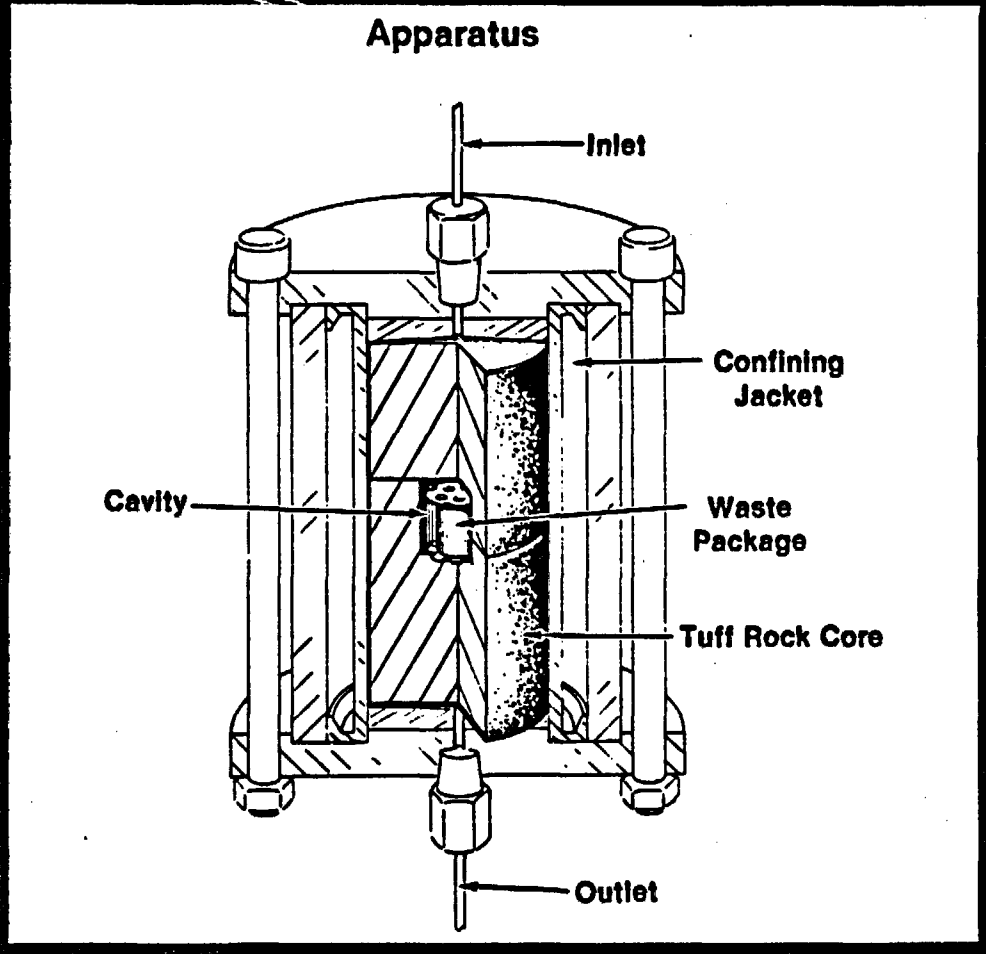
## INTERACTIONS IN THE UNSATURATED TEST

*NOT NECESSARILY RELATED TO A SPECIFIC TIME PERIOD OR WASTE PACKAGE MODEL.

1. WATER FILM AT A SS/GLASS INTERFACE.
2. STANDING WATER AT A SS/GLASS INTERFACE (WELD AFFECTED).
3. WATER FILM IN CONTACT WITH GLASS.
4. STANDING WATER IN CONTACT WITH GLASS.
5. INTERMITTENT WATER/WATER VAPOR CONTACT WITH GLASS (STRESSED AND SMOOTH SURFACE).

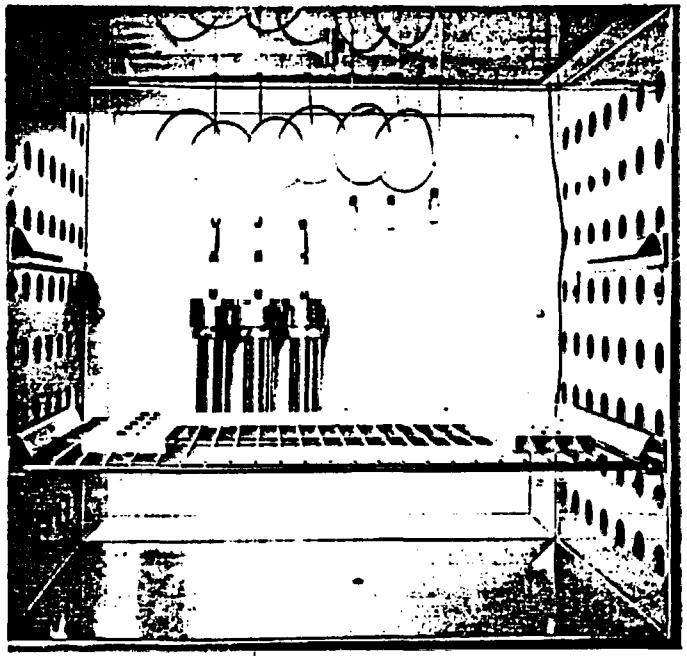
The relevance of the test method to the NNWSI repository site conditions must be demonstrated. One method to accomplish this is via an analog test.

Analog Test Apparatus



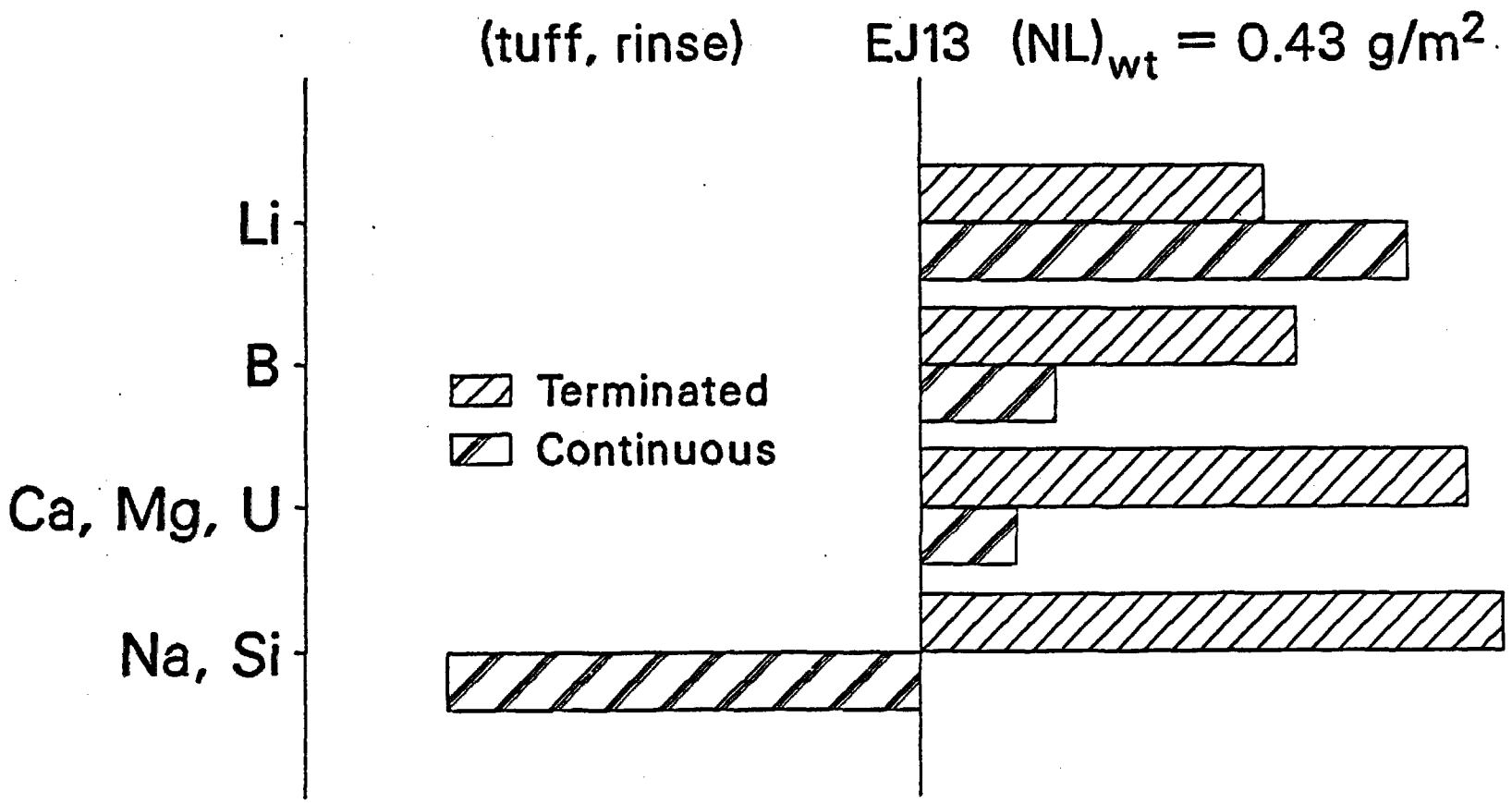

In a 13 week analog test, $(NL)_{wt}$ was 0.1 $g/m^2$

The test apparatus is designed for reproducible testing of simulated and actual waste glass



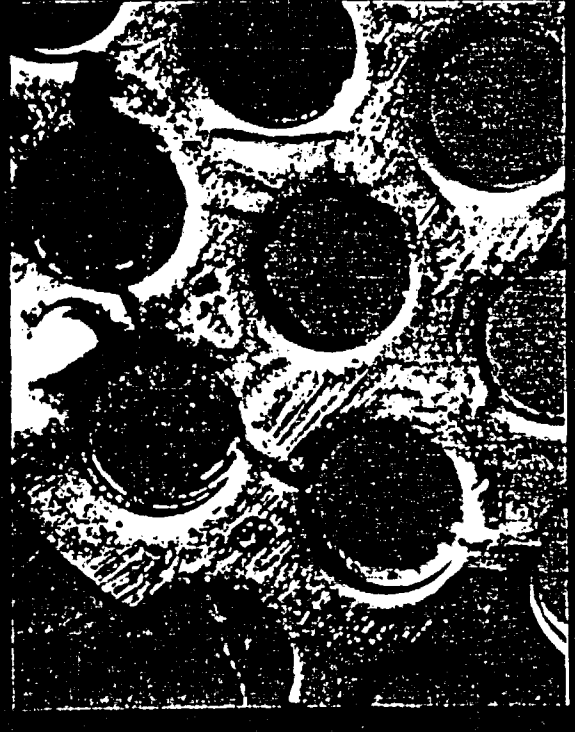
Based on 26 weeks of unsaturated testing, trends are being established that indicate the reproducibility of the test is acceptable (±15%).

Elemental Release Trends - SRL 165 (U, Cs, Sr), 26 weeks

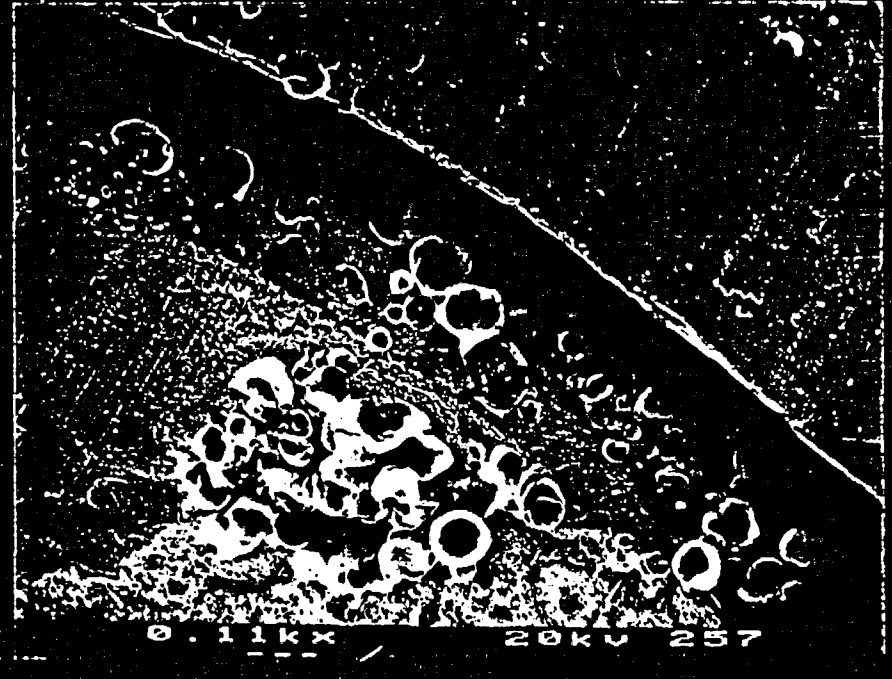


Corrosion of the glass and the SS is observed in regions of glass/metal contact. This occurs mainly in the weld affected areas and could accelerate degradation of the waste package after breach.

Photo of
Waste Glass Support

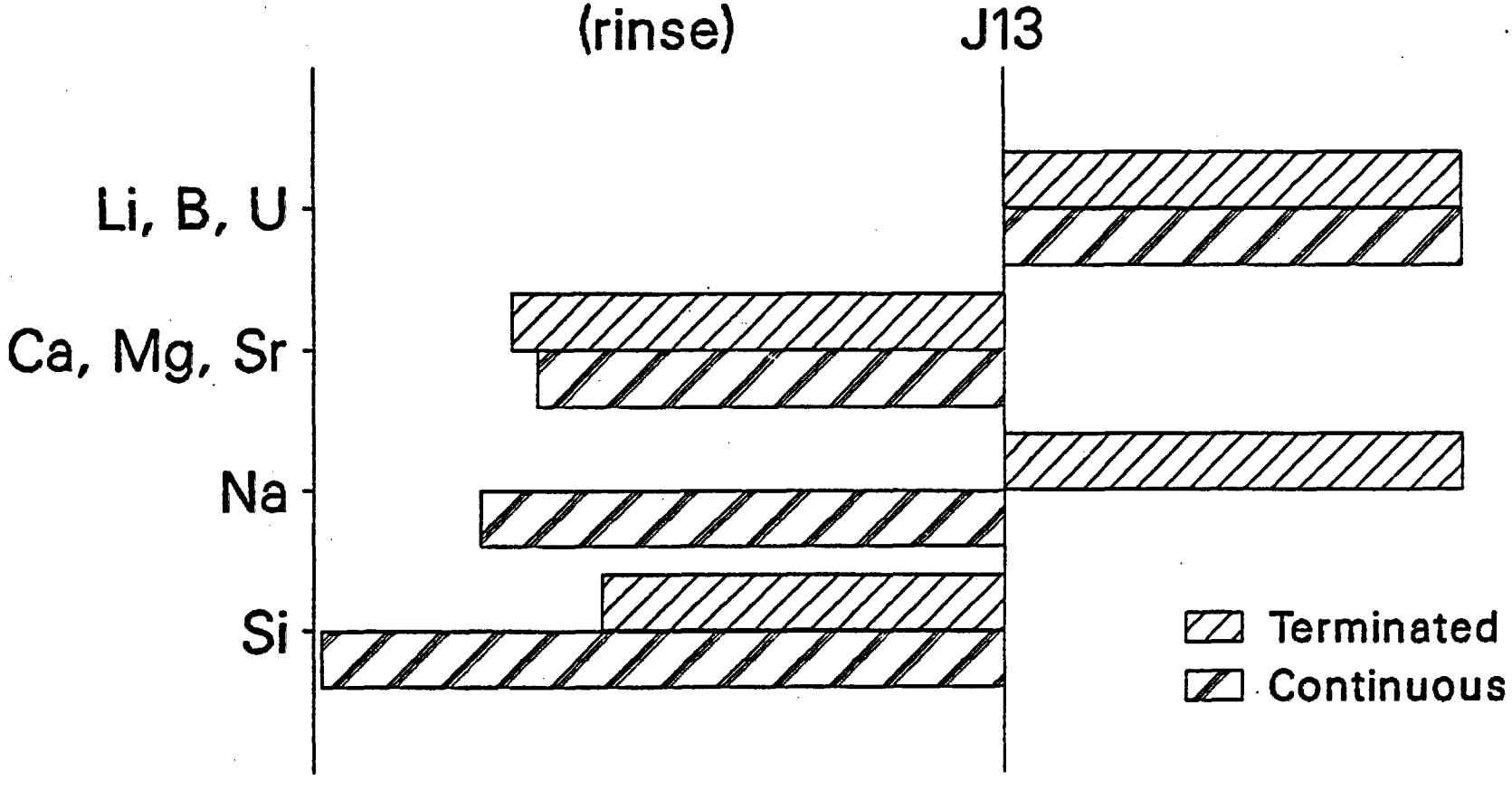


Micrograph of
Corroded Area



Parametric tests provide valuable information for interpreting results from the unsaturated test, and investigate the effect of changing selected test parameters.

Elemental Release Trends - 39 weeks, glass only



## PARAMETRIC TESTS IN PROGRESS (GLASS)

1. GLASS ONLY (TEFLON STAND), REGULAR SA, 0.075 ML/3.5 DAYS, COMPLETE THROUGH 52 WEEKS (65 WEEKS).

2. GLASS/SS, 1/2 SA, 0.075 ML/3.5 DAYS, COMPLETE THROUGH 26 WEEKS (32.5 WEEKS).

3. GLASS/SS 1/2 SA, 0.0375 ML/3.5 DAYS, COMPLETE THROUGH (13 WEEKS).

4. GLASS/SS REGULAR SA, 0.075/14 DAYS, STARTED 6/10/85.

# Conclusions

- A waste form performance test has been developed that applies to unsaturated conditions expected for the NNWSI repository site.

26 week data indicates


- Reproducible
- Site relevant