



8650 Commerce Park Place
Suite K
Indianapolis, IN 46268

Press Release

Nochar™ Acid Bond High Radiation Durability Testing of Solidified Liquids with pH's 1,7, and 14.2

FINAL OBSERVATION DATA 8/27/04

High radiation durability testing was conducted at the School of Nuclear Engineering of Purdue University in West Lafayette, Indiana, under the direction of the Department of Nuclear Engineering and Nochar, Inc. of Indianapolis, Indiana.

Purpose of the tests were to observe any physical changes in stability and form that may occur in various liquid waste streams solidified using Nochar™ Acid Bond as a result of long term radiation exposure. The tests conducted were similar to those which were previously and successfully conducted on Nochar's Petro Bond by Savannah River Technical Center.

Description of Nochar Acid Bond N960. The Nochar™ Acid Bond is an acrylamide and co-polymer of acrylic technology that is used to stabilize non-hydrocarbon liquids throughout the entire pH range. Waste-to-polymer ratios may vary according to pH, chemistry, and solids content of the waste stream.

Testing and Results

In addition to the visual observations of the waste, matrix blotter and paint filter testing were conducted on each sample to validate the visual observations.

Samples totaling (11) 50 cc viles were solidified as follows:

Sample Set A. (3) viles of muratic acid (1 pH) at a (1) to (1) ratio by weight

Sample Set B. (3) viles of tap water (7 pH) at a (1) to (1) ratio by weight

Sample Set C. (3) viles of Hanford Tank simulant (14.2 pH) at a (1) to (1) ratio by weight

Sample Set D. (2) viles of nitric acid (1 pH) at a (1) to (1) ratio by weight

Waste samples were solidified using Nochar's N960 Acid Bond at the weight- to- weight ratios stated above.

The test chamber used for this test was a **Gammacell 220 model # 80-220**. The gamma source used for this test was a **Cobalt 60 source**.

Observations were conducted on this date by the following individuals:

Dennis Campbell
Senior Vice President
Nochar, Inc.

Edward Merritt
Senior Lab Technician
School of Nuclear Engineering
Purdue University

Observations were made at **998 hours** of exposure to the source for Sample Sets A,B,and C. Sample D (nitric acid solution) was added to the test later by request and received **484.33 hours** or **36.5 mega rad** of exposure.

Visual Observations

Sample	Results
A	Passed
B	Passed
C	Passed
D	Passed

The three viles marked sample "A" (muratic acid) showed little change since being placed into the Gammacell 220 on 7/9/04. Moderate discoloration occurred but no free liquids were observed.

The three viles marked sample "B" (7.0 pH liquid) all showed minimal discoloration and none of the samples showed free liquid release.

The three viles marked sample "C" (14.2 pH Hanford Tank simulant AN105, 5 molar) all showed no discernable discoloration and exhibited no free liquids.

The two viles marked sample "D" were added to the Gammacell on 8/3/04 and both samples showed little discoloration and exhibited no free liquids.

Blotter Tests

Sample	Results
A	Passed
B	Passed
C	Passed
D	Passed

All samples were subjected to a blotter test to further determine if any unbound liquids were present. Blue litmus paper was cut into 2" by 4" strips and each strip was weighed prior to placing the solidified waste onto the strips.

The material was allowed to remain in contact with the test strips for **10 minutes**. After the time limit had been reached, the solidified samples were removed from the test strips. None of the samples showed absorption into the paper and no discoloration was observed.

Paint Filter Tests

Sample	Results
A	Passed
B	Passed
C	Passed
D	Passed

All samples were placed into paint filters and tested according to **EPA METHOD 9095**. All samples were then checked for free liquid release.

Calculations

According to officials at Purdue University, the cobalt 60 source was generating a field of 1.259 krad/minute at the point at which testing began. Utilizing this information, based on the number of exposure hours to the source, (998 hours), the sample sets **A,B,C**, would have received a gamma dose in excess of **75 mega rad**. Sample **D** (nitric acid) was exposed for 484.33 hours or received **36.5 mega rad**.