

SRNL Internship Experience

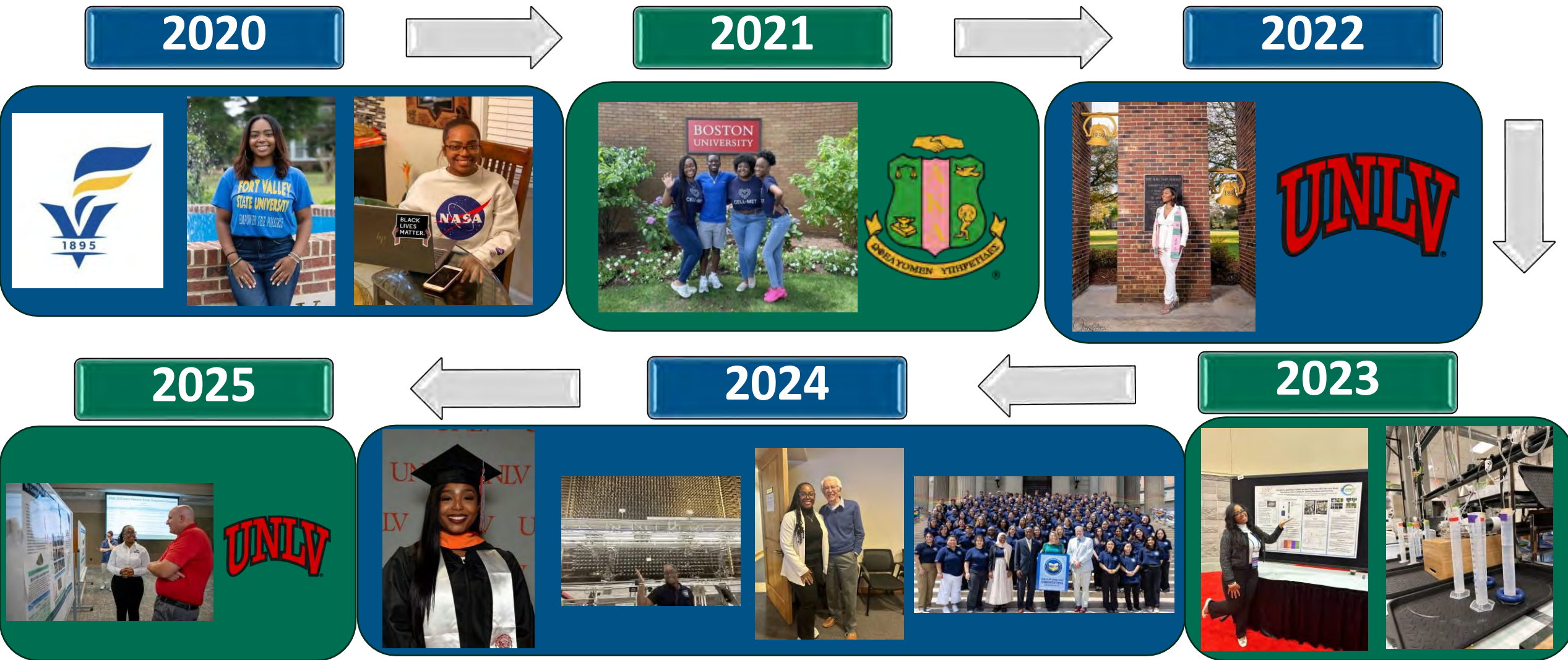
CNTA Up and “**Atom**” Breakfast: July 23, 2025

Colette Towles, ASPIRE Doctoral Intern

SRNL-TR-2025-00520



My Background



The Cohort



Introduction

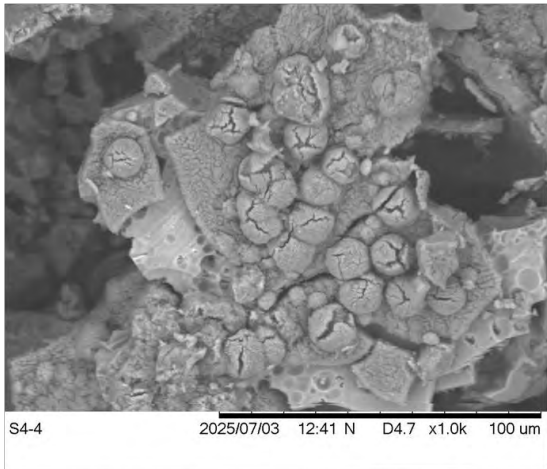
- More than 4% of the solid waste generated in the US is from glass, and only about 25% is recycled. This accumulates 3 million additional cubic meters of space every year.
- Engineered cellular magmatics (ECMs) are fabricated from waste glass powder that is mixed with a foaming agent and fired in a kiln, producing a porous glass foam material.
- In this study, we examined the sustainability of the ECMs in a salt simulant similar to the composition of low-activity nuclear waste tanks.



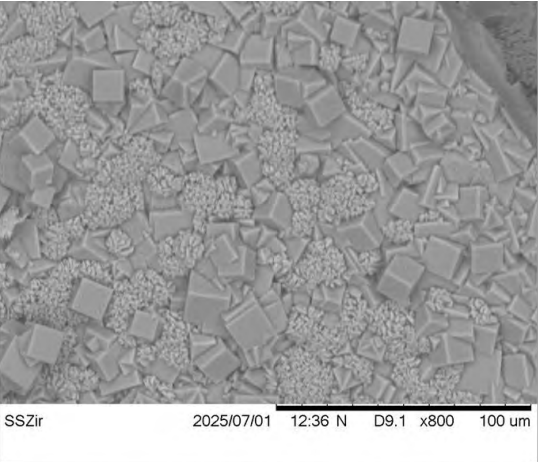
Results for 1M Sodium Hydroxide + Sodium Aluminate Solution

Before
Placed in
Salt
Simulant

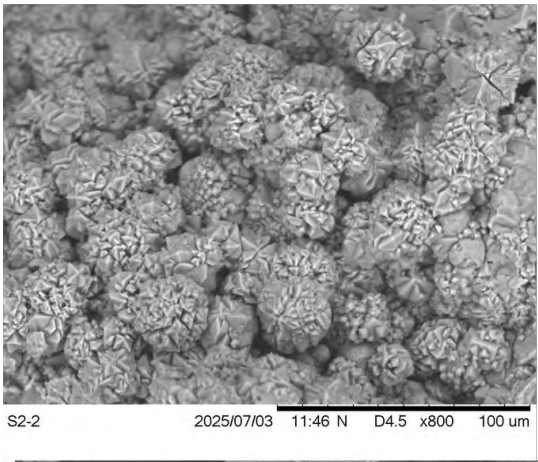
1 Day Zeolite Growth



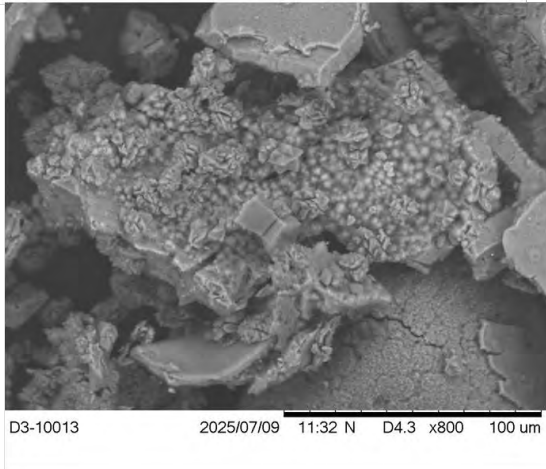
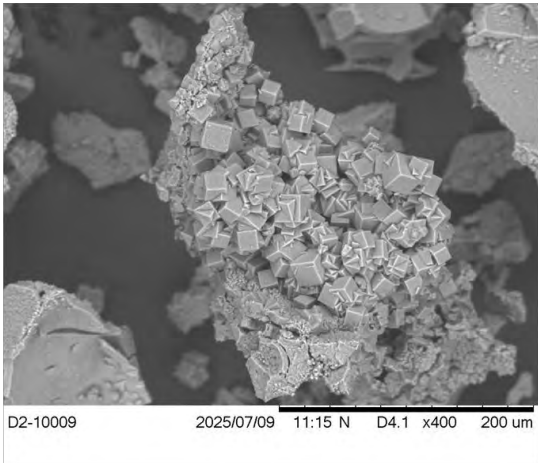
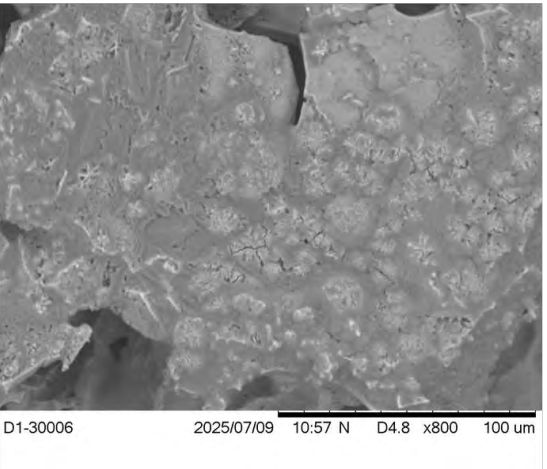
5 Day Zeolite Growth



7 Day Zeolite Growth



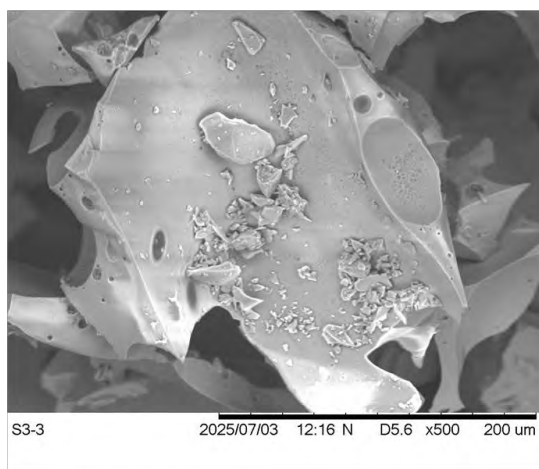
After
Placed in
Salt
Simulant



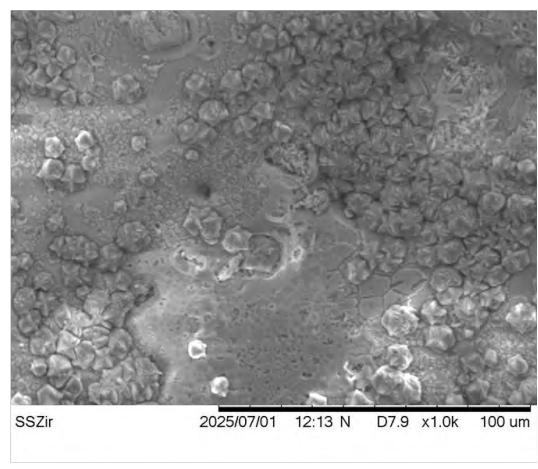
Results for pH 12.5 Sodium Hydroxide + Sodium Aluminate Solution

Before
Placed in
Salt
Simulant

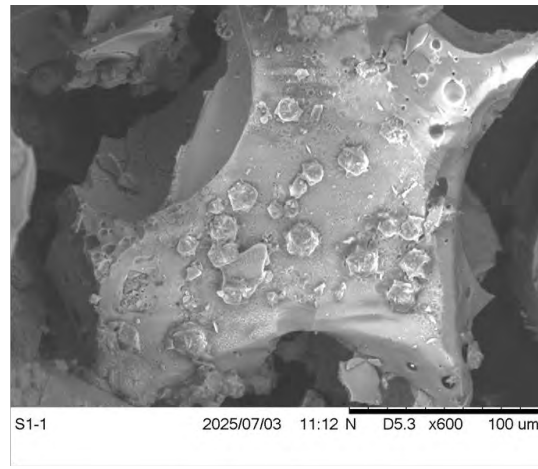
1 Day Zeolite Growth



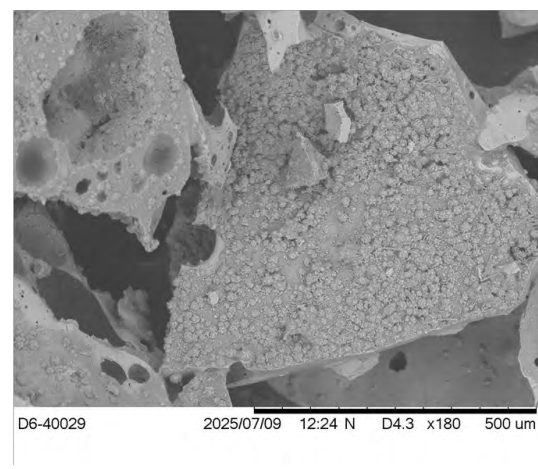
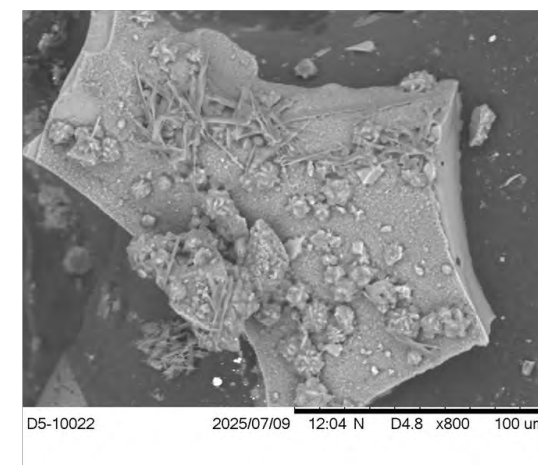
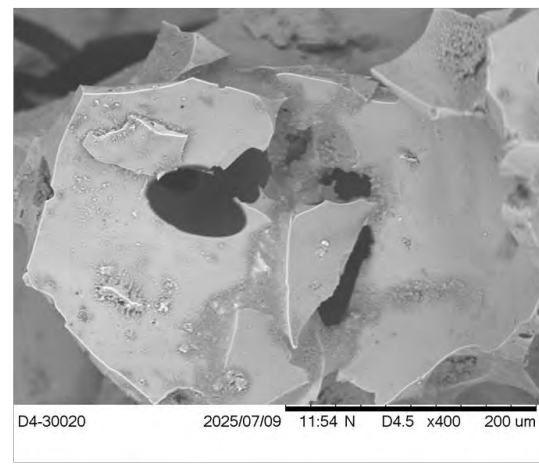
5 Day Zeolite Growth



7 Day Zeolite Growth

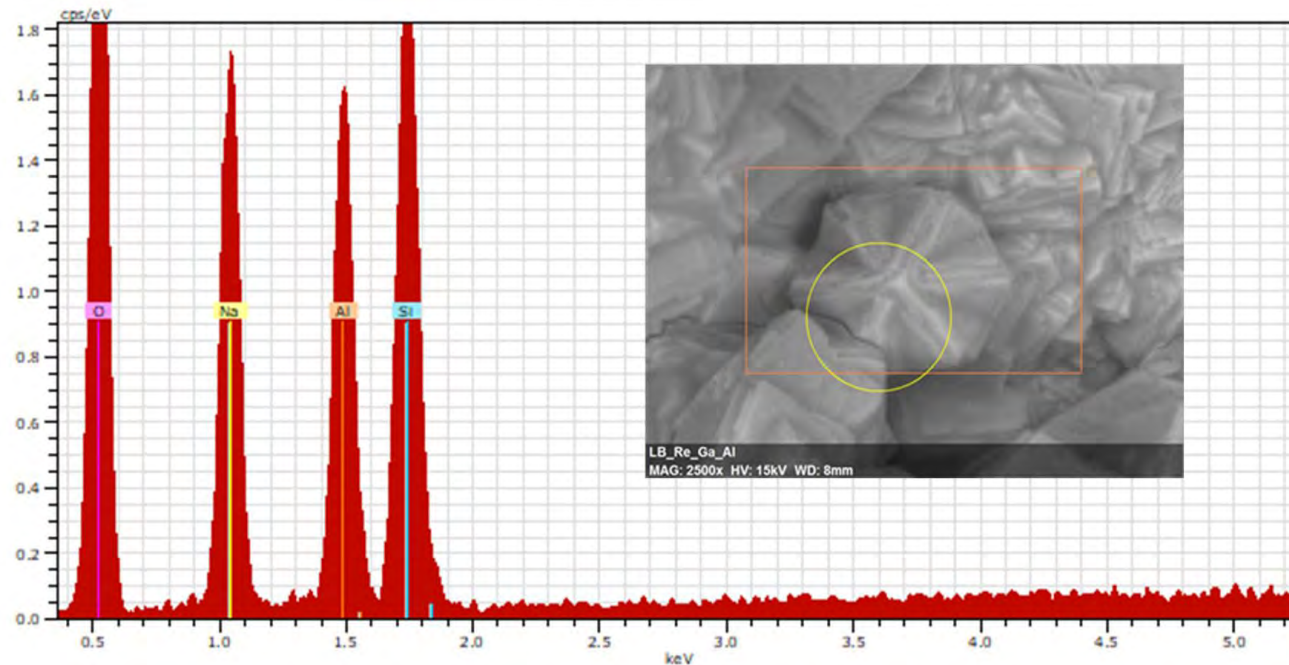


After
Placed in
Salt
Simulant



Energy Dispersive X-ray Spectroscopy (EDS) Analysis

Energy Dispersive X-ray Spectroscopy (EDS) is a technique used to identify and quantify the elemental composition of a sample.



Spectrum: Point

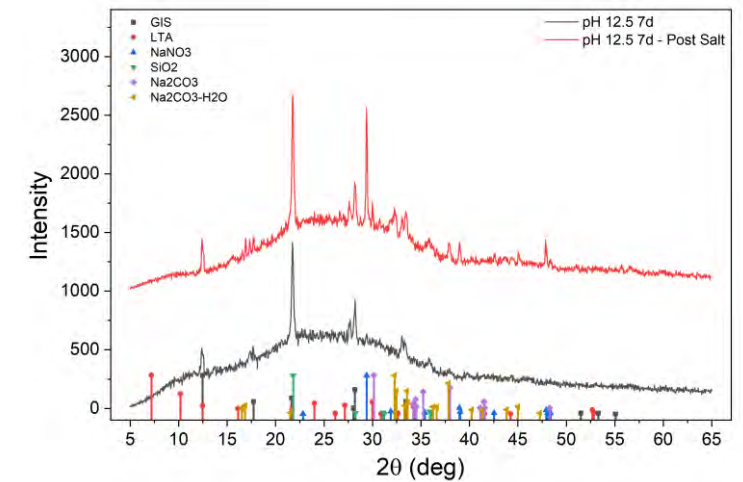
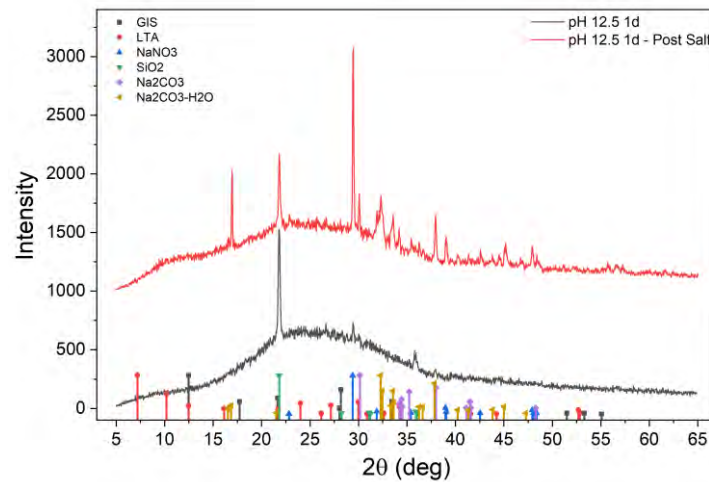
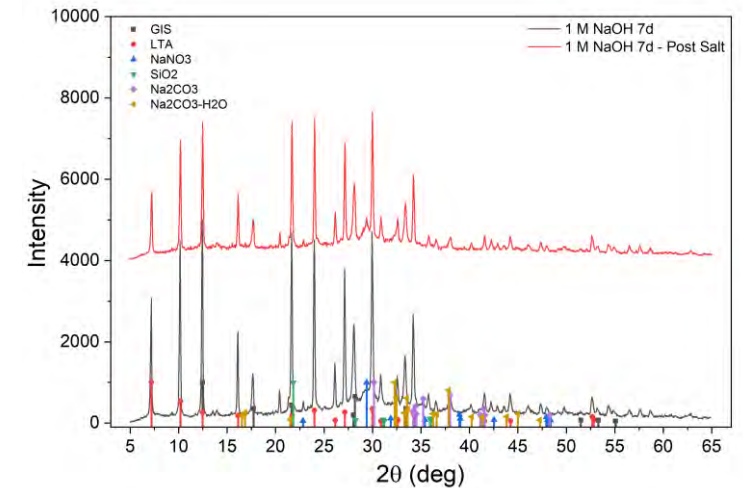
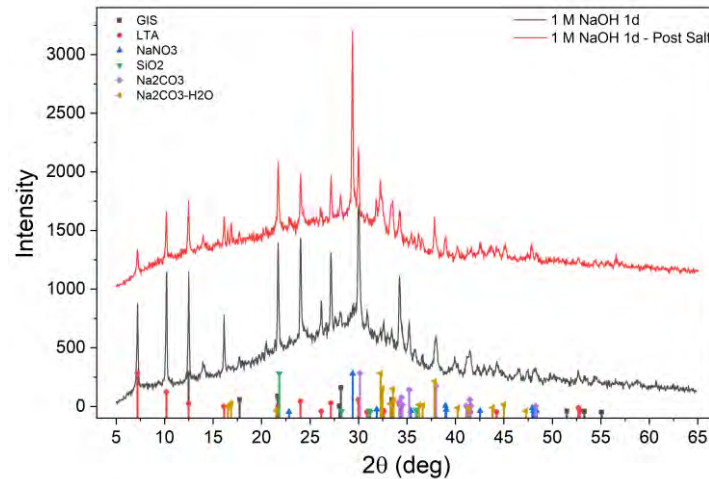
Element	AN	Series	unn. C	norm. C	Atom. C
			[wt.%]	[wt.%]	[at.%]

Oxygen	8	K-series	131.74	49.91	61.58
Sodium	11	K-series	47.93	18.16	15.59
Silicon	14	K-series	49.06	18.58	13.06
Aluminium	13	K-series	35.24	13.35	9.77



X-ray Diffraction (XRD) Analysis

X-ray diffraction is a technique used to determine the atomic structure and composition of materials, particularly crystalline materials.



What have I learned?



Nuclear is the future.

Nuclear is MY future.

Never be afraid to speak up.

I LOVE SRNL!





RESUME

THANK YOU! 😊



CONTACT CARD