Disposal of Nuclear Waste

Problem: What problems are encountered when storing nuclear waste?

1. You are a scientist who tests nuclear waste storage containers that will be used underground. The sodium hydroxide pellets represent solid nuclear waste that will be radioactive for thousands of years.

Hypothesis: Which one do you think will do well? Which one do you think will fail?

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2. Fill your jar about ¾ full water. Use the dropper bottle to add 4 drops of phenolphthalein solution to each jar.
3. Handling the pellet with the tweezers, wrap one of the pellets tightly in:

   _____ aluminum foil _____ clay

   _____ plastic wrap and a twist tie

4. Make sure it is water tight. Gently drop your wrapped pellets into your jars and the unwrapped one into the control jar.
5. Observe all of the jars and record your information on the data table.

Data Table:

Storage Container	Observations 1st day	Observation 3rd day
Control		
Aluminum		
Plastic		
Clay		

Analysis:

1. What happened when you put a sodium hydroxide pellet into the water of the control jar?

2. Did any of the wrapped pellets show signs of leakage? If so, which type of wrapping was used?

3. Which material would make the best storage container with an acceptable risk against leakage?

Conclusion:

What did you hypothesize at the beginning of this activity regarding the problems associated with storing nuclear waste?

Did your observations support the hypothesis? Explain.

What modification could you make to the experiment that would alter the results?