### Required Training

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<th>UC Lab Safety Fundamentals</th>
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### Required PPE

- Lab coat, safety glasses/goggles,
- Nitrile gloves

### Equipment

- Two 600 mL beakers

### Chemicals

- 1M Sodium Hydroxide Solution
- 1M Hydrochloric Acid
- 0.5% Aqueous Zinc Chloride Solution

### Procedure:

1) Put 50 mL of the zinc chloride solution into a large beaker.
2) Slowly add sodium hydroxide to the beaker, forming a dense white precipitate.
3) Transfer equal portions of the precipitate into each of two beakers.
4) Add sodium hydroxide to one of the beakers and add hydrochloric acid to the other beaker.
5) Note that the precipitate dissolves in both the acid and the base.

### Discussion:

An ampholyte is a compound which reacts with both acids and bases. A clear solution of sodium hydroxide is added to a clear solution of zinc chloride. A white precipitate is formed: the insoluble ampholytic compound zinc oxide. Either acid or base will dissolve this precipitate by the following reactions:

\[
\text{ZnO}_\text{(s)} + 2 \text{HCl} \rightarrow \text{ZnCl}_2(\text{l}) + \text{H}_2\text{O}
\]

OR

\[
\text{ZnO}_\text{(s)} + \text{H}_2\text{O} + 2 \text{NaOH} \rightarrow \text{Na}_2[\text{Zn(OH)}_4](\text{l})
\]

### Hazards:

Both acids and bases are corrosive; handle with care and wash with water for 15 minutes if spilled on skin or in eyes.
Both zinc oxide is relatively safe, but zinc chloride must be handled with particular care as it is toxic to the aquatic environment and corrosive.

**SOP:**

Corrosive – Hydrochloric Acid, Sodium Hydroxide, Zinc Chloride

**Disposal (by Storeroom):**

Give to the storeroom—do not flush down the drain. Send properly labeled waste to EH&S for disposal.