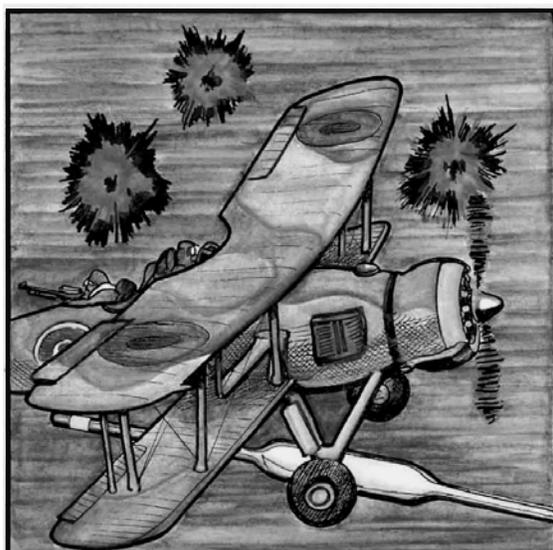




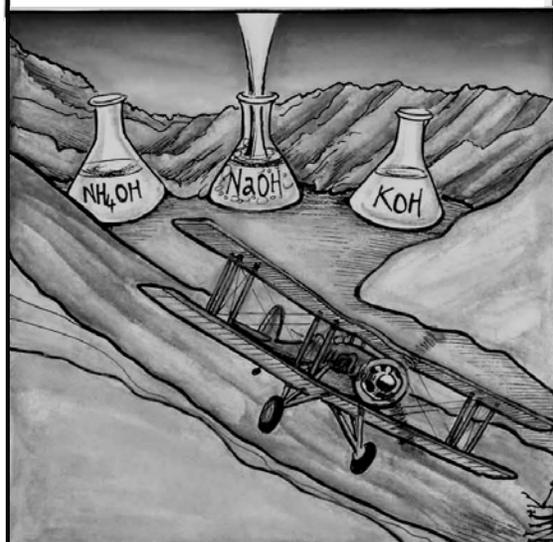
Is Dilution the Solution?

- Some industries produce acidic wastes. Do acids become harmless as they are diluted?
- How much H₂O is needed to neutralize an acid?
- Let's see what happens to 50 mL of 1 M HCl ...

Volume of H ₂ O added	Total volume	predicted pH	Measured pH
50 mL	100 mL		
150 mL	200 mL		
250 mL	300 mL		
450 mL	500 mL		
950 mL	1 L		



Despite the heavy flak, McAllister's aim was true, and his carefully measured aliquot of hydrochloric acid found its mark deep in the enemy's reservoir of sodium hydroxide.



McAllister grinned wryly: finally, one of the enemy's strongest bases had been completely neutralized

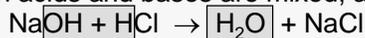
By Nick D. Kim

Mixing HCl with NaOH (demonstration)

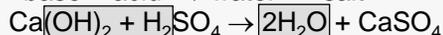
- Get a 100 mL beaker, 10 mL graduated cylinder (fill to 10 mL with NaOH), eye dropper, 50 mL beaker with about 15 mL HCl, glass stirring rod
- Add 10 mL NaOH to 100 mL beaker.
- Add 3 drops phenolphthalein to dish. Stir.
- While stirring, add acid (about 7 mL to start, then drop by drop until solution is colourless).
- Set up your retort stand with wire mesh (no fume hood necessary)
- Heat mixture at low boil until it evaporates.
- Leave beaker with product at front of room.
- Clean up your lab station

Writing neutralization equations

When acids and bases are mixed, a salt forms

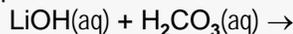


base + acid → water + salt

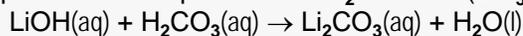


Question: Write the chemical reaction when lithium hydroxide is mixed with carbonic acid.

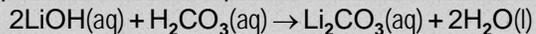
Step 1: write out the reactants



Step 2: determine products ... H₂O and Li¹(CO₃)²



Step 3: balance the equation



lithium hydroxide + carbonic acid → lithium carbonate + water

Assignment

Write balanced chemical equations for these neutralization reactions. Under each compound give the correct IUPAC name.

- iron(II) hydroxide + phosphoric acid
- $\text{Ba(OH)}_2\text{(aq)} + \text{HCl(aq)}$
- calcium hydroxide + nitric acid
- $\text{Al(OH)}_3\text{(aq)} + \text{H}_2\text{SO}_4\text{(aq)}$
- ammonium hydroxide + hydrosulfuric acid
- $\text{KOH(aq)} + \text{HClO}_2\text{(aq)}$