Class #8
Solution Stoichiometry

CHEM 107
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Reaction Stoichiometry
• Same idea as for pure substances!
• Balanced equation!
• Moles!
• Use concentrations and volumes to find numbers of moles

Titration Example
• Titration: find concentration of solution by reaction
  \( \text{H}_2\text{SO}_4 + 2\text{NaOH} \rightarrow \text{Na}_2\text{SO}_4 + 2 \text{H}_2\text{O} \)
• If 20.00 mL of NaOH neutralizes 25.00 mL of 0.0800 M \text{H}_2\text{SO}_4, what is the \text{NaOH} concentration?
Limiting Reagents

• Same idea as before!
• Identify limiting reagent, then solve problem
• Dissolve Mg in HCl:
  1.5 g Mg reacts with 30 mL of 2.0 M HCl. What’s the concentration of Mg$^{2+}$ in the flask after reaction?

Applied Problem

• HPO$_4^{2-}$ is a water pollutant, but is used in the treatment of sewage
• Removed by treatment with lime (CaO)
• Lime dissolves in water to give Ca$^{2+}$ and OH$^-$
• Phosphorous precipitates as Ca$_3$(PO$_4$)$_2$OH

Phosphate Cleanup

• How many kg of lime are needed to remove all phosphorous from a 10$^4$ L tank which is 0.0156 M in HPO$_4^{2-}$?
  ➤ Write a balanced equation for dissolving the lime.
  ➤ Write a balanced equation for the precipitation.
  ➤ Use those equations to solve.

We’ll work through this in class. It is a good recap of much of what we have been doing for the last few days, although a couple of steps are a little difficult.