Safety Slide: LiAlH₄

1. LAH is a colorless solid, but commercial samples are usually gray due to contamination. This material can be purified by recrystallization from diethyl ether. Large-scale purifications employ a Soxhlet extractor. Some commercial materials contain mineral oil to inhibit reactions with atmospheric moisture, but more commonly it is packed in moisture-proof plastic sacks.

2. LAH violently reacts with water, including atmospheric moisture. The reaction proceeds according to the following idealized equation:
   \[ \text{LiAlH}_4 + 4 \text{H}_2\text{O} \rightarrow \text{LiOH} + \text{Al(OH)}_3 + 4 \text{H}_2 \]

3. How to quench your reaction: (1) cool your reaction to 0 °C (or lower depending on the scale/equivalents of LAH); (2) slowly add x mL of water; add x mL of 15% aqueous sodium hydroxide (or potassium hydroxide (3) add 3x mL of water warm to rt and stir 30 min, Optional: add some anhydrous magnesium sulfate and stir 15 min, filter over Celite.

LAH is soluble in many ethereal solutions. However, it may spontaneously decompose due to the presence of catalytic impurities, though, it appears to be more stable in tetrahydrofuran (THF). Thus, THF is preferred over, e.g., diethyl ether, despite the lower solubility.