

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:



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.



Solubility of LiAlH₄ (mol/L) [9]

Solvent	Temperature (° C)				
	0	25	50	75	100
Diethyl ether	–	5.92	–	–	–
THF	–	2.96	–	–	–
Monoglyme	1.29	1.80	2.57	3.09	3.34
Diglyme	0.26	1.29	1.54	2.06	2.06
Triglyme	0.56	0.77	1.29	1.80	2.06
Tetraglyme	0.77	1.54	2.06	2.06	1.54
Dioxane	–	0.03	–	–	–
Dibutyl ether	–	0.56	–	–	–