

A Report on Reagents and its Quenching Methods

Tsolakidou Anastasia

Department of Chemistry, Aristotle University of Thessaloniki, GR-54124 Thessaloniki, Greece

BRIEF REPORT

Received date: 04/10/2021

Accepted date: 18/10/2021

Published date: 25/10/2021

*For Correspondence

Tsolakidou Anastasia, Department of Chemistry, Aristotle University of Thessaloniki, GR-54124 Thessaloniki, Greece.

E-mail: zikidis11@hotmail.com

Keywords: Quenching, Grignard reagent, Reactive chemicals.

BRIEF REPORT

Lithium aluminium hydride

LAH stands for Lithium Aluminium Hydride, which is an inorganic substance having the chemical formula LiAlH_4 . It's a solid grey colour. Finholt, Bond and Schlesinger found it in 1947. This chemical is employed in organic synthesis as a reducing agent, particularly for the reduction of esters, carboxylic acids and amides. The solid reacts violently with water, producing gaseous hydrogen (H_2). For hydrogen storage, certain similar derivatives have been explored.

Quenching:

- Adding a saturated aqueous sodium sulphate drop by drop (Na_2SO_4).
- Dropwise add one ml water, 1 ml, 15 percent aqueous NaOH and ultimately 3 ml water for each (one) gramme of lithium aluminium hydride used. Using a celite pad, filter the resultant solid. Rinse well with solvent.
- Alternatively, the mixture can be diluted with diethyl ether and dried (anh. sodium sulphate, stir 15 minutes) after the last water addition to create an easily filtered mixture that can be filtered through paper if desired. The crude product is obtained by evaporating the filtrate. This technique is particularly beneficial for polar compounds that have high water solubility.
- Add three equivalents of sodium fluoride (NaF), then a 9:1 THF:Water combination dropwise.
- Using a celite pad, filter the resultant white solid. THF should be used as a rinse. This technique can result in a finer solid that traps less of the desired substance.
- Dropwise addition of Rochelle's salt aqueous solution (sodium potassium tartrate, $\text{KNaC}_4\text{H}_4\text{O}_6$).
- Using a mortar and pestle, recrystallize sodium sulphate from water and crush it with an equivalent volume of celite. This combination can be kept indefinitely in the refrigerator. To quench your LAH reduction, add one spatula full of celite/hydrated sodium sulphate to the reaction mixture at a time. This will be exothermic and may cause the reaction to stop stirring briefly; nevertheless, maintain adding the solid until the mixture stirs again. Filter through a fritted funnel once the solution has been quenched and freely stirred, wash the solid with a little amount of THF or diethyl ether, then evaporate the solvent to extract your product.

Grignard reagent

For organic synthesis, Grignard reagents (RMgX) are widely employed. However, these extremely reactive chemicals are delivered in flammable solvents, making transportation more difficult. Grignard reagents with linear alkyl chains may be confined and stabilised by the macrocyclic host pillar arene while preserving their reactivity, as shown in this paper.

Quenching:

- Place your RBF in an ice bath after removing it from the oil bath. The quench becomes less enraged as a result of this. If you have a condenser, leave it turned on.
- DROPWISELY ADD WATER-Dropwise really does imply dropwise! If you're not careful, you'll end up with a volcano. Continue to add water until the RBF is no longer enraged. Allow another five minutes for stirring.
- DROPWISELY add ten percent sulfuric acid. Be patient one again. Continue to add—very slowly—until the rage diminishes. I generally leave it to stir for 20 minutes to an hour or two at this stage, depending on how busy I am. Allow any remaining magnesium and related salts to dissolve.