

Protocol for quenching reactive chemicals

Highly reactive hydrides, metallic and organometallic reagents should be quenched according to the following procedure. Neutralization of excess reagents and the cleaning of used glassware should be done carefully. When a syringe, glassware or spatula is used in handling highly reactive or pyrophoric reagents, the assembly should be rinsed with an inert solvent and the rinse transferred to a flask under an inert atmosphere for subsequent neutralization. Excess reagent should also be dissolved/dispersed in an inert solvent under inert atmosphere. Typical inert solvents can be hydrocarbons (toluene, heptane, hexane, etc.; high boiling point solvents are preferred when the quenching releases excess amount of heat). Ideally, dispersing highly reactive reagents should be operated in glove-boxes. Rinsates or solvents containing highly reactive reagents should then be cooled in an ice bath prior to the quenching reaction. For extremely reactive compounds (e.g., $^5\text{BuLi}$, $^t\text{BuLi}$), dry ice/acetone bath and N_2 stream may be necessary. The quenching is done first with isopropanol. Isopropanol should be continuously added until no further heat is released. Next, slowly add methanol as a more reactive quenching agent to ensure completion. Then copious amount of water (stronger neutralization agent) is added to ensure that there are no reactive materials left. **Quenching rates should be chosen to allow enough time for gases and heat to be released in a controlled way.** Then the resulting mixture can be disposed using the institute's standard waste disposal procedure.