

ETA Chemical Sample Container Management Best Practices

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Proper management of chemical samples is not only a key component in ensuring accurate and reliable test results, but is also an important part of ensuring a safe laboratory area. Samples that are improperly stored or identified can lead to serious injuries or incidents involving hazardous chemical reactions. This includes large accumulations of old samples left in drawers and cabinets that are not clearly identified.

Additional information on management of chemical containers, including those containing sample materials can be found in the LBNL Chemical Hygiene and Safety Plan: <https://www2.lbl.gov/ehs/pub3000/CH45/CH45c.html>

The following are best practices researchers should consider in the management of samples generated in their lab areas:

1. Sample Identification

All sample and secondary containers must be clearly identified for chemical contents and any associated hazards (flammable, corrosive, reactive, toxic, non-hazardous). Labels must be legible, prominently displayed, and written in English. The researcher's name and date created are recommended information if space is available.

There may be practical limitations to carrying out the above labeling requirements on small containers such as sample vials and tubes. Alternatives such as labeling a tray or rack that holds the containers or applying a numbering or coding system are permissible provided that the material's identity and hazards are readily accessible (e.g., by means of a spreadsheet, or some equivalent means) to research personnel in the laboratory and that they understand the system.

If needed, there is a recommended sample label maker: Dymo 450 "LabelWriter" available from Staples on eBay. Approximate cost is \$100. Sample label stock that is resistant to conditions in cold refrigerators called "Cryotags" are available through VWR.

Samples do not normally have to be bar coded or entered into the Chemical Management System (CMS). **However, bar coding is required for samples that contain time sensitive chemicals such as peroxide formers.**

2. Sample Log

A sample log is used to track multiple samples collected within the lab area. This can be through the use of a spreadsheet. See attached example sample tracking spreadsheet. In the event that there is a large number of sample containers and each cannot be clearly labeled, a log or spreadsheet is required. Each individual sample container can be identified through a numbering or code system.

It is critical that the log, or spreadsheet is readily available to the Principal Investigator and other researchers working in the lab area. Preferably, this information is stored with the samples until they are properly disposed.

3. Sample Containers

The type of sample containers used must be compatible with the materials placed into it. Some solvents can dissolve plastic containers. Some corrosives, such as hydrofluoric acid, can etch/dissolve glass containers.

The sample container volume should be minimized to the actual size needed. This will prevent unnecessary hazardous waste disposal and conserve storage space.

4. Sample Storage

Samples must be stored in designated locations within the lab area. The use of drawers is discouraged unless designated by the lab area Principal Investigator and the drawer is clearly identified for sample storage.

Samples containing hazardous materials and/or liquids should be stored in designated chemical cabinets:

- Store flammable liquid samples in flammables liquid storage cabinets
- Store temperature sensitive samples in refrigerators or freezers designated for hazardous materials storage.

- Store air/water reactive samples inside inert glove boxes.
- All other samples should be stored in designated cabinets that are clearly identified as sample storage locations with the following information:
 - Name of sample type (example: “Nitrate Salt Solutions Containing Transition Metals”)
 - Hazard classification (Toxic, Corrosive, Flammable, Non-Hazardous, etc.)
 - Start date of samples
 - Name of researcher

Samples that contain incompatible chemicals must not be stored together. Liquid chemical samples must be stored in secondary containment trays in the event of leakage.

5. Sample Transport

Samples can be hand carried from one lab area to another in a box or tray. Under no circumstances should public transportation such as the LBNL shuttles be used for transporting hazardous samples.

In the event that samples must be shipped off-site to another location, the LBNL Shipping Department must be contacted. There is an on-line request form available to initiate the process. A Safety Data Sheet (SDS) must be provided for the samples so that Shipping can determine the proper packaging, labeling, and shipping mode. LBNL Shipping: <https://commons.lbl.gov/display/fac/Shipping>

6. Sample Retention

Monitor stored samples and do not keep them for longer than necessary. Refrigerator, freezer, or glove box space can be limited. Planning is required for samples requiring long term storage. An inventory of these types of samples should be retained and reviewed at specified intervals (quarterly) to determine when they should be discarded. Maintaining samples for more than 2 years is considered long-term storage.

Trays or boxes containing accumulations of samples should have a name, date, and retention time indicated for items requiring long term storage. Arrangements should be made with the Principal Investigator in the event samples need to be retained after the researcher leaves LBNL.

Samples containing time sensitive peroxide former chemicals such as tetrahydrofuran, ethyl ether, and diethylene glycol dimethyl ether must be clearly identified with a peroxide former warning label and tested for peroxide former concentrations at least every 12 months. For additional information, go to the Chemical Safety and Hygiene Plan, Process P:

https://www2.lbl.gov/ehs/pub3000/CH45/CH45_7.html#_Work_Process_P.

Samples may also contain other types of time sensitive chemicals such as “unstable/self-reactive with production of gaseous products” or “explosive when dry.” These samples must also be identified as time sensitive and closely monitored. Do not store these types of samples any longer than necessary. For additional information, go to the Chemical Safety and Hygiene Plan, Process P1:

https://www2.lbl.gov/ehs/pub3000/CH45/CH45_7.html#_Work_Process_P.1.

7. Sample Disposal

Samples must be properly disposed when they are no longer needed or prior to the researcher leaving LBNL. Chemical samples that are flammable, corrosive, reactive or toxic must be collected and disposed as hazardous waste. A waste sample is presumed to be hazardous unless specifically determined to be non-hazardous. If unsure if a sample is hazardous or not, consult the Safety Data Sheet (SDS) or contact the ETA Division Safety Coordinator.

Compatible flammable solvent samples can be added to an existing flammable liquids disposal can (flam can). Keep track of the types of samples added and quantity on the accumulation log associated with the flam can being used. Empty “drip dry” vials can be placed inside a “broken glass” waste box located in the lab area.

Other hazardous liquid samples and solid samples made up of the same constituents can be collected in a Ziploc baggie with a red hazardous waste label affixed. An example of a good waste description on the red waste label is: “SAMPLE VIALS CONTAINING NICKLE HYDROXIDE (20-30%), COBALT HYDROXIDE (30-40%), and MANGANESE HYDROXIDE (40-50%).” Each sample container must be 60ml or less in volume in order to label the entire Ziploc bag containing multiple vials as one item.

A hazardous waste requisition must be submitted for all samples being disposed of. To request a waste pick-up, submit a waste requisition the same way you would for any other hazardous waste generated in the lab area. Once submitted, the requisition will be processed and scheduled for pick-up and disposal. LBNL's Hazardous Waste Requisition Request System is located at:

<https://wastereq.lbl.gov>

In some cases, samples may be considered non-hazardous and placed in the regular trash. Place the samples inside a Ziploc bag and write the non-hazardous constituents on the outside (example: SILICA and TIN OXIDE). Clearly write or place a sticker on the baggie that states "NON-HAZARDOUS."

SAMPLE TRACKING LOG SHEET

Name:

Lab Area:

Date:

Sample ID	Contents	Hazard Class

- **Keep this sample tracking log sheet with your samples at all times**
- **Properly store samples in designated sample storage locations according to hazard**
- **Properly dispose of your samples once they are no longer needed**

Sample Label Maker:



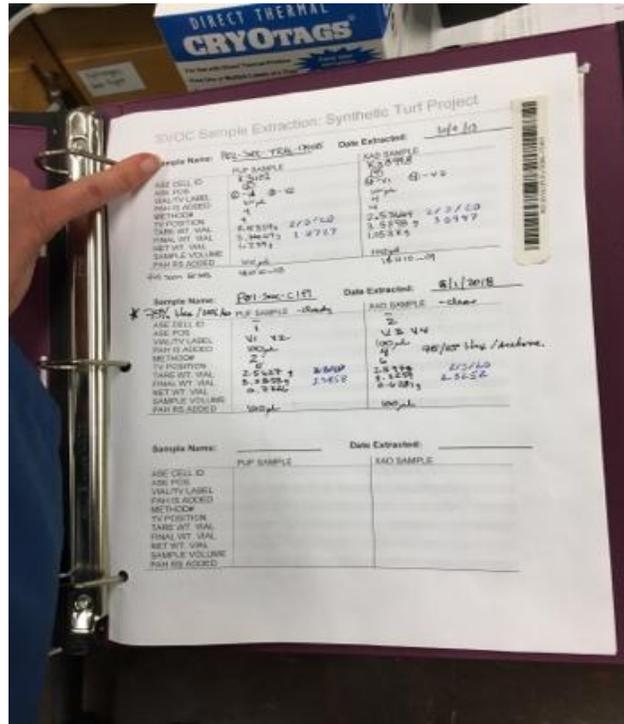
Example Sample Container Label:



Example Sample Storage:



Example Sample Log:



Example Waste Disposal:

