

Section 5.24 Title: Ovens and Desiccators
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Revision Date: 11/01/19
P.I.: Prof. John F. Berry

Prior Approval: This procedure is NOT considered hazardous enough that prior approval is needed from the Principal Investigator.

Involves Use of Particularly Hazardous Substance (PHS)? No
 Carcinogen Reproductive Toxin High Acute Toxicity
Does this procedure require medical surveillance? No
Does this require use of a fit-tested respirator? No

Brief Description of Procedure:

Use ovens to keep laboratory equipment free of atmospheric moisture prior to water-sensitive syntheses or use in a glovebox. Use desiccators to keep potentially hygroscopic chemicals free of atmospheric moisture.

Location: *List the locations (buildings/rooms) where this procedure may be performed. For use of a PHS indicate a more precise location within the room, if appropriate, as a designated area.*

Daniels Chemistry - All Berry group labs

Chemicals Involved:

Chemical	Physical or Health Hazard (e.g. carcinogen, corrosive)
Hygroscopic chemicals	Consult relevant SDSs for more details
Drierite™ (CaSO ₄ , CoCl ₂ indicator)	Eye/skin irritant; lung irritant if inhaled. CoCl ₂ is a high-suspect carcinogen

Other Hazards: *Include hazards, other than chemical, that may be present during operation of the procedure.*

Burn risk: when handling hot glassware, use insulating gloves. Electrical hazards: ensure oven power cords and outlets are in good working condition.

Exposure Controls: *(Check all that apply)*

PPE: Safety Glasses Face Shield Chemical Splash Goggles
 Chemical Apron Gloves (Nitrile) Lab Coat
 Respirator (type) Other:

Engineering Controls:

Fume Hood Biosafety Cabinet Glove box
 Vented gas cabinet Other:

Administrative Controls: *List any specific work practices needed to perform this procedure (e.g., cannot be performed alone, must notify other staff members before beginning, etc.).*

N/A

Task Hazard Control Table: *For procedures involving numerous steps, it may be convenient to indicate specific requirements for individual tasks in the table below:*

N/A

Waste Disposal: *Describe any chemical waste generated and the disposal method used.*

Spent Drierite can be disposed of as solid waste. Other drying agents should be quenched as appropriate.

Accidental Spills: *Describe the procedure for handling small chemical spills that may occur during this procedure. Note that for large spills it may be appropriate to call 911.*

Contain spill with spill kit appropriate for chemical. Drying agents can be swept up and disposed of in solid waste.

Decontamination Procedures (required for PHS use): *Describe the procedure for decontamination of personnel and equipment.*

N/A

Training: *Describe any training needed prior to performing this procedure. Include training performed in-lab and any required demonstrations of competency.*

No formal training or documentation is required. This procedure should be demonstrated by experienced lab members. New members should talk through their procedures with experienced lab members.

Principle Investigator Approval: I have reviewed this procedure and approved it for use. Note: Modifications to the procedure may require update to this form.

Name: John F. Berry

Signature: _____

Date: _____

Ovens and Desiccators

General Tips (Ovens):

- Hot glass looks like cold glass. Always use insulating gloves on both hands when handling items taken from an oven. Keep tongs close by for handling hot glassware as well.
- Never place corrosive, combustible, or plastic/wax items in an oven; they melt and/or present a fire hazard. An oven should only be used for dry glassware, needles/cannulas, Teflon stir bars, silica and molecular sieves.
- As a loose guideline, hot glass to be taken into the glovebox should be set in an oven overnight prior to cycling in the antechamber. NMR/EPR tubes however, can be brought in after 20 minutes, and should be kept flat on a piece of foil in an oven for only short periods of time to prevent warping.
- Communal ovens used for silica/sieves, needles/cannulas, common glassware, and vials for glovebox use are located in the back left of 6325 (right of the fridge) and front right of 6319 (left of chemical storage cabinet).

As per manufacturer guidelines, keep ovens at least 6 inches clear of walls or combustible materials. Aim to keep ovens at approximately 150°C. On personal ovens, an alcohol thermometer can be fit through a hole in the top of the oven to monitor temperature. When the set temperature is reached, the red "Heat" light will illuminate. After several minutes, heat will begin to cycle on and off to maintain constant temperature. When not in use, make sure oven doors are securely shut.

Keep needles/cannulas flat on a piece of foil or in a beaker on a higher shelf. If they come into contact with the baseplate below the lowest oven shelf, the oven may short circuit. If you are the last person to leave lab, place clean needles/cannulas and oven-ready glassware (kept in the bins beside communal ovens in 6319 and 6325) inside a communal oven. Occasionally move the oven temperature dial to keep electronic contacts fresh. In the event of oven malfunctions, contact the machine shop or manufacturer.

Other notes: avoid stacking items or otherwise overfilling ovens. Personal ovens are for glassware that you intend to use in the coming days, not for storage of your favorite glassware. Communal ovens are for high-use items or items that don't fit in personal ovens. They, too, are not for storage. Oven contents should be checked periodically (this is part of group cleanups) to remove items no longer necessary.

Boekel Scientific (Personal Ovens): 1-800-336-6929

VWR (6319 Communal Oven): 1-800-932-5000

Despatch (6325 Communal Oven): 1-800-473-7373

General Tips (Desiccators):

- All chemical samples placed in a desiccator should be potentially hygroscopic solids kept within their own sealed containers. No water (including D₂O) should ever be placed in a desiccator.

- The bottom layer of a glass desiccator below a ceramic/metal disc should be filled with a desiccant (usually indicating drierite). If this drierite changes from blue to pink in color, it should be disposed in solid waste and replaced with fresh drierite.
- The rim of a glass desiccator lid should be kept greased to ensure sealing. To open a desiccator, slowly push the lid horizontally until the seal is broken and the lid can be removed. Ensure that this seal is remade when placing the lid back on. Do not set the lid on a lab bench, as any particulate matter introduced to the grease will compromise the lid's seal.
- Ensure that the doors remain shut and all clasps are secure on the acrylic desiccators in 6315a. Store reagents in their appropriately marked desiccator (e.g. keep oxidants and reductants separated).

Desiccators are also used for cooling glassware, and one is next to each communal oven for this purpose. Other drying agents (P_2O_5 or NaOH/KOH) are sometimes called for, but are not generally maintained in the group due to their reactivity.