CLEAN UP OF MILLING VIALS:
Standard operating procedure

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Description

The milling vials from any of the ball mills, including shaker, planetary, and attritor mill may contain dense deposits after milling runs. This document describes procedures that should be used to clean up the milling vials from such deposits.

Initial cleaning:

Inspect the vials for dense deposit. Following steps are suitable for minor deposits (less than 0.5 g of material or less than 10 % of the internal vial surface is coated with deposits).

a. If material is capable of self-sustaining reaction (as for metal-oxidizer composites), place the vial in the glovebox.
b. For all other materials, clean up in the fume hood.
c. Wipe down the surfaces with hexane or other hydrocarbon solvent. Remove remainder of the deposit using a chisel or a similar tool operated on a wet vial surface. Do not use alcohols or acetone until the deposit is removed.
d. When using a chisel or scraper outside the glove box, work behind sash of fume hood.
e. Properly dispose all the waste.

Cleaning of significant deposits

If initial inspection suggested that deposit is significant (more than 0.5 g of material or more than 10% of the internal vial surface is coated with deposit), use following procedures:

a. Add milling balls (use the same balls as used during the material preparation experiment)
b. Add sand (approximately 1 g of sand for shaker mill vials, or 3-5 g for planetary mill vials)
c. Add hexane. Recycled hexane is OK to use. Do not use alcohols or acetone. Other suitable solvents are heptane, or octane, if available.
d. Close the milling vial following SOP for respective mill operation.
e. Place the vial into the mill and operate for 5 minutes.
f. Inspect the cleaning progress by opening the vial following SOP for respective mill operation.
g. If necessary, repeat clean up procedure.
h. Properly dispose all the waste.