




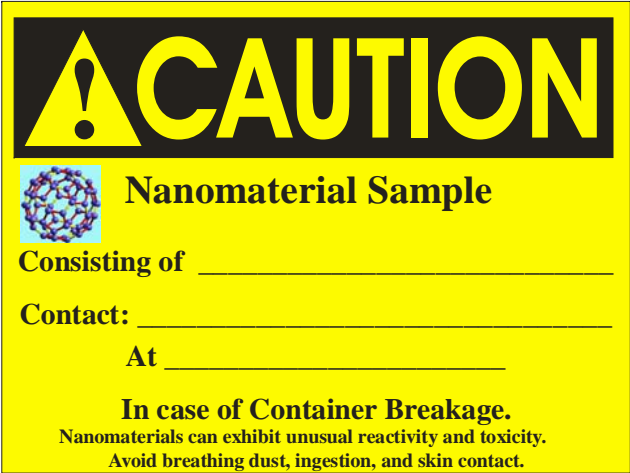
NSLS Nano-science Safety Requirements LS-PRM-1.3.5a Section 7, Rev 4, Effective Date 1/12/2009

The only official copy of this file is the one on-line. Before using a printed copy, verify that it is the most current version by checking the effective date.

RISK 	LOW	MEDIUM	HIGH
Material Form  Requirements 	Fixed Nanostructures		Free Nanoparticles
PPE Requirements for Handling	Standard PPE required for the work area. No additional PPE is needed for this nanomaterial work.		Standard PPE required for the work area plus: <ul style="list-style-type: none"> • Gauntlet-type nitrile gloves “or” wrist length disposable nitrile gloves with extended tyvek sleeves • Eye protection: Safety glasses with side shields for handling powders only. Chemical splash goggle for handling either powders or liquids.
Handling Requirements	<ul style="list-style-type: none"> • For work outside of a HEPA filtered exhaust hood: <ul style="list-style-type: none"> ○ No Mechanical stresses e.g., (grinding, scraping, or pressing). ○ No thermal stresses ○ Cover samples when practical e.g., (slide cover, Kapton tape, Mylar tape, or cellophane tape). • Store in sealed container when not in use. 		<ul style="list-style-type: none"> • If there is a potential for particle aerosol formation manipulate within a HEPA filtered laboratory exhaust hood over adsorbent paper to capture any spills. • Solutions brought to the beamline must be: <ul style="list-style-type: none"> ○ Transported in sealed containers. ○ Stored in secondary containment. ○ Manipulated over an absorbent paper to capture any spills. ○ Kept wet (do not allow solutions to dry out and form particulates). • Work surfaces must be wiped with a dampened adsorbent paper towels at the completion of the experiment (aqueous soap solution).

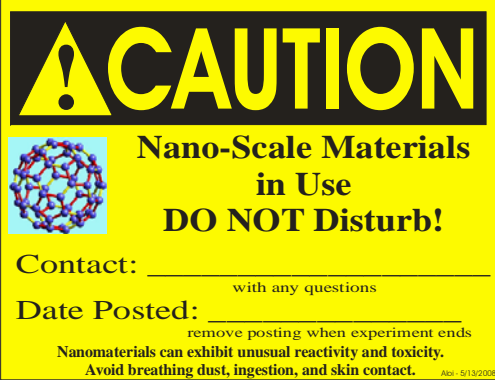
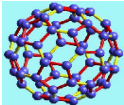
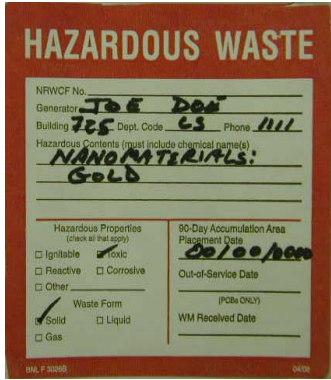
NSLS Nano-science Safety Requirements LS-PRM-1.3.5a Section 7, Rev 4, Effective Date 1/12/2009

The only official copy of this file is the one on-line. Before using a printed copy, verify that it is the most current version by checking the effective date.

RISK →	LOW	MEDIUM	HIGH
Material Form →	Fixed Nanostructures		
Requirements ↓			
Labeling of Containers	Follow the labeling requirements list below in the “Transportation & Labeling Requirements” section. Labels are available in the NSLS Stockroom.		
Transportation & Labeling Requirements	<u>ALL NANOMATERIALS MUST BE SHIPPED WITH SECONDARY CONTAINMENT</u> (i.e. a container within another container).		
	<p>Any nanomaterial that meets the definition of hazardous materials according to 49 CFR 171.8 (http://a257.g.akamaitech.net/7/257/2422/12feb20041500/edocket.access.gpo.gov/cfr_2004/octqtr/pdf/49cfr171.8.pdf) or has known hazardous properties (toxic, flammable, reactive) must be shipped according to the NSLS Shipping Requirements (http://www.nsls.bnl.gov/esh/safety/shipping.htm) for Hazardous Materials.</p> <p>➤ Other nanomaterials may be carried in private vehicles when labeled and packaged in secondary containment as follows:</p> <p>Labeling:</p> <ol style="list-style-type: none"> The inner package must be labeled as follows (Labels are available in the NSLS Stockroom): <div data-bbox="934 769 1560 1239" style="border: 1px solid black; padding: 10px; background-color: yellow; margin: 10px auto; width: fit-content;">  </div> <p>Packaging:</p> <ol style="list-style-type: none"> Inner containers must be a tightly sealed, rigid, and leak proof. Use tape on the cap to prevent the container from being unintentionally opened. Place the inner container in a ≥6 mil plastic bag. The outer package (sealed cardboard box “or” sealed plastic container) must be filled with absorbent material to protect the inner container and absorb liquids during an inner container failure. 		

NSLS Nano-science Safety Requirements LS-PRM-1.3.5a Section 7, Rev 4, Effective Date 1/12/2009

The only official copy of this file is the one on-line. Before using a printed copy, verify that it is the most current version by checking the effective date.

RISK	LOW	MEDIUM	HIGH
Material Form Requirements	Fixed Nanostructures	Solutions	Free Nanoparticles
Area Posting Requirements	N/A	<p>The required nanomaterials caution sign can be found here (http://www.nsls.bnl.gov/esh/SAF/nano_sign.pdf), please post a sign at each designated nanomaterials workstation (i.e. beam line hutch and laboratory exhaust hood) for the duration of your experiment. Remove posting when experiment ends.</p> <div style="text-align: center;">  </div>	
Waste Management Requirements	<ol style="list-style-type: none"> 1. All unwanted materials in contact with nanomaterials must be disposed as hazardous waste e.g., (swabs, Kim wipes, blotter paper, beakers, flasks, tape, and sample holders). 2. Chemicals containing nanomaterials must NOT be released to the sink or discarded in the regular trash. 3. Waste containers must be placed into a clean secondary bag as they are removed from the HEPA exhaust hood. Practice good contamination control by placing the waste container into a clean bag at the hood opening, before transferring to the Satellite Accumulation Area (SAA). 4. All waste containers are kept in a tray for secondary containment within the designated SAA. <ol style="list-style-type: none"> a. Liquids: are kept in a rigid leak proof containers. b. Particulates: may be kept in a rigid leak proof containers "OR" >=6 mil zip lock plastic bags. 5. Waste container labeling: <ol style="list-style-type: none"> a. <u>Red Hazardous Waste Label:</u> <ol style="list-style-type: none"> i. NO chemical formulas (spell out the chemical name). ii. The contents line on the label must contain the chemical composition and the word "NANOMATERIALS" (Labels are available in the lab). b. <u>Contains Nanomaterials Label:</u> <ol style="list-style-type: none"> i. Required in addition to the red label hazardous waste label (Labels are available in the lab & NSLS Stockroom). <div style="text-align: center; margin-top: 10px;">  Contains Nanomaterials </div> <div style="text-align: right; margin-top: 10px;">  </div>		
Spill Response	N/A	<p>Powder spills within an exhaust hood can be cleaned by using paper towels and an aqueous soap solution. Liquid spills within a hood can be cleaned with paper towels and then wiped with an aqueous soap solution. For spills outside of an exhaust hood, control access to the area and immediately notify the Operations Staff by calling the Control Room at x2550.</p>	