***Task Risk Assessment‑Word Document***

Modified By: Author

**Transportation and analysis of samples** (insert name of sample here) **in XRD**

**Name:**

**Task/Process ID:**

**Task/Process Details**

Based on **19727**

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**Author:**

**Supervisor:**

**Last Updated By:**

--------------------------------- On --/--/201-

**Effective Risk Level:**

**Low**

**Action:**

Risk is normally acceptable

**Campus:**

**Faculty/Division:**

**School/Centre:**

**Workplace:**

St Lucia

Fac ‑ Science

CMM X‑Ray Analytical Facility

Approval Date:

**Workplace Location of the Task/Process**

**Status: Approved**

**Risks Associated with this Task/Process or Situation**

**Audited By:**

**Audit Date:**

--/--/201-

Centre for Microscopy and Microanalysis (CMM)

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***Task Risk Assessment‑Word Document***

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Powdered samples (pre‑packed or unpacked) are transported to the facility for analysis.

**Process\Job Desc:**

**Transportation of samples/waste to and from CMM XRD Facility.**

**Risk Situation:**

**Current Controls:**

Isolation/containment: Samples transported in double sealed plastic container or equivalent. Outer container should be impact resistant plastic. It is strongly recommended that powdered samples are mounted on substrate prior to transport. Waste samples / contaminated material requiring specialized disposal (e.g. through Chemwaste) are to be returned to the lab of origin and a suitable container for all this material is required.

An appropriate spill kit may be required for some hazardous samples. This may include ‑

 PPE: e.g. nitrile gloves, absorption/collection material: e.g. wet paper towels and neutralising agents.

Chemical

**Energy Source:**

Sample is dropped during transport and person is exposed to material.

**Hazard Event:**

Single contact with chemical or substance

**Incident Category:**

**Prepared By:**

**Assessment Date:**

25/10/2011

***Risk Analysis***

**Consequence:**

Minor

**Rationale:**

Consequence of contact with sample varies depending on material. For most samples the consequence is minor. Please select the appropriate consequence for your material.

**Exposure:**

**Rationale:**

Occasional

Individuals transport samples approximately once a month/week on average.

**Probability:**

**Rationale:**

Conceivable

Injury is highly unlikely if control measures are followed but a breakdown in controls is conceivable.

**Risk Level:**

**Low**

**Action:**

**Risk is normally acceptable**

No Additional Controls

Samples (powders and occasionally solids) are packed in a specialized holder prior to insertion in the XRD. Spills may occur during packing.

**Process\Job Desc:**

**Packing of sample in XRD holder**

**Risk Situation:**

**Current Controls:**

Elimination: Strongly recommend sample is mounted prior to transport.

Engineering: Fumehood must be used to process material if any loose particles are likely to be present or if material is hazardous.

Administration: Spill kit available. Detailed risk assessment submitted for all samples with spill and clean up procedures included.

PPE: Enclosed shoes, gloves (nitrile or latex), lab coat, protective eyewear. Mask (P2) may be required to clean up spills of some materials.

Chemical

**Energy Source:**

Sample spilt during mounting contacts or is inhaled by XRD operator.

**Hazard Event:**

Single contact with chemical or substance

**Incident Category:**

**Prepared By:**

**Assessment Date:**

25/10/2011

***Risk Analysis***

**Consequence:**

Minor

**Rationale:**

Consequence of contact with sample varies depending on material. With most samples the consequence is minor. Please select the appropriate consequence for your material.

**Exposure:**

**Rationale:**

Occasional

An individual's samples are packed approximately once a week to once a month.

**Probability:**

**Rationale:**

Conceivable

Consequence may occur if control measures are not followed.

**Risk Level:**

**Low**

**Action:**

**Risk is normally acceptable**

No Additional Controls

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Samples are removed from the holder after analysis. Spills are possible during this process.

**Process\Job Desc:**

 **Unpacking of sample from holder**

**Risk Situation:**

**Current Controls:**

Engineering: Fumehood required for all unpacking of hazardous material.

Administration: On‑hand detailed spill procedures required for all sample types before processing begins.

PPE: Enclosed shoes, gloves (nitrile, latex), lab coat, protective eyewear. Mask (P2) may be required for some spills

Chemical

**Energy Source:**

Unpacking of sample produces a minor spill which contacts operator or is inhaled by operator.

**Hazard Event:**

Single contact with chemical or substance

**Incident Category:**

**Prepared By:**

**Assessment Date:**

25/10/2011

***Risk Analysis***

**Consequence:**

Minor

**Rationale:**

Consequence of contact with sample varies depending on material. With most samples the consequence is minor. Please select the appropriate consequence for your material.

**Exposure:**

**Rationale:**

Occasional

An individual's samples are packed approximately once a week to once a month.

**Probability:**

**Rationale:**

Remotely possible

Spills while unpacking are quite possible but contact with person has not occurred. However it is a remote possibility.

**Risk Level:**

**Low**

**Action:**

**Risk is normally acceptable**

No Additional Controls

Samples are transferred out of the fumehood and mounted in the XRD by the instrument manager. Additional engineering and PPE controls may be required to avoid exposure to some hazardous samples.

**Process\Job Desc:**

 **Loading of sample in XRD**

**Risk Situation:**

**Current Controls:**

 Appropriate controls will vary depending on the sample. Please select the appropriate controls. Controls may include:

* Re‑housing the sample in a sealed plastic container and only removing it inside the XRD (if safe to do so).
* Covering the sample (e.g. cling‑wrap) at all times.
* Wearing additional PPE ‑ lab coat, safety glasses, gloves, mask (P2) ‑ for spills.

Chemical

**Energy Source:**

XRD operator is exposed to loose powdered sample (by direct contact or inhalation) while transferring sample to XRD.

**Hazard Event:**

Single contact with chemical or substance

**Incident Category:**

**Prepared By:**

**Assessment Date:**

25/10/2011

***Risk Analysis***

**Consequence:**

Minor

**Rationale:**

Consequence will vary according to sample properties. In most cases the most likely consequence is a minor or no injury. Please select the most likely outcome of exposure to sample type.

**Exposure:**

**Rationale:**

Occasional

XRD operator may transfer an individual's samples approximately once a month to once a week.

**Probability:**

**Rationale:**

Conceivable

No injury has occurred but it is conceivable it may occur with some samples.

**Risk Level:**

**Low**

**Action:**

**Risk is normally acceptable**

No Additional Controls

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Automated sample analysis may result in the spill of some material. Spill procedures for decontaminating the equipment are required.

**Process\Job Desc:**

**Analysis and removal of samples from the XRD**

**Risk Situation:**

**Current Controls:**

Engineering: Sample and spill containment may be required ‑ e.g. enclosed plastic container.

Administration: On‑hand detailed spill procedures required for all sample types before processing begins.

PPE: Enclosed shoes, gloves (nitrile or latex), lab coat, protective eyewear. Mask (P2) may be required for some spills.

Radiation

**Energy Source:**

 Operator is exposed to sample/spills.

**Hazard Event:**

Single contact with chemical or substance

**Incident Category:**

**Prepared By:**

**Assessment Date:**

25/10/2011

***Risk Analysis***

**Consequence:**

Minor

**Rationale:**

Most likely consequence of contact with sample varies depending on material. With most samples the consequence is minor. Please select the appropriate consequence for your material.

**Exposure:**

**Rationale:**

Occasional

XRD operator may transfer an individual's samples approximately once a week to once a month.

**Probability:**

**Rationale:**

Remotely possible

Spills from analysis are quite possible although contact with person has not occurred. However it is a remote possibility.

**Risk Level:**

**Low**

**Action:**

**Risk is normally acceptable**

No Additional Controls

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**Chemical Risk Assessment Details**

**Substances: (1)**

**Substance Name:**

**Form:**

**Concentration:**

**Hazardous Substance:**

**UN Number:**

**DG Class:**

**Yes**

Solid

Not classified as a Dangerous Good

**SAMPLE: ---------------------------------------------**

100%

Long term health effects of nanoparticles have yet to be determined. Treat as potentially hazardous.

**General Information:**

**Health Effects**

**Hazardous Reactions**

**Route of Exposure**

**Evidence of Exposure**

NIL:

NIL:

NIL:

NIL:

**Yes**

**Yes**

**No**

**Yes**

Irritant:

**No**

Explosive:

**No**

Inhalation:

**Yes**

Presence of dusts/fumes/odours:

**No**

Corrosive:

**No**

Flammable:

**No**

Skin absorption:

**Yes**

Leaks/spills/residues:

**No**

Sensitiser:

**No**

Peroxide forming chemicals:

**No**

Eye contact:

**No**

Worker symptoms and complaints:

**No**

Asphyxiant:

**No**

Water reactive:

**No**

Ingestion:

**No**

Previous incidents and exposures:

**No**

Toxic:

**No**

Oxidising agents:

**No**

Needlestick:

**No**

Neighbouring activities impact:

**No**

Carcinogenic:

**No**

Cryogenic:

**No**

Mutagenic:

**No**

Pyrophoric:

**No**

Teratogenic:

**No**

Cytotoxic:

**No**

Neurotoxic:

**No**

Reproductive:

**No**

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**Risk Control**

**Elimination/Substitution:**

Samples are integral to the process and cannot be substituted for less hazardous material.

Isolation/containment: Samples transported in double sealed, plastic container. Strongly recommend sample is mounted on substrate if possible. Highly toxic powders should be covered at all times e.g. use "cling‑wrap" to cover sample. Fume cupboard: To be used for all unmounted sample processing. Adhesion to substrate should be checked before removal from fumehood.

**Engineering Controls:**

Effective and maintained well

**Effectiveness:**

Written emergency procedures: This risk assessment (available in lab). Good housekeeping practices: Spills cleaned up immediately. Detailed labels required. Good personal hygiene practices: Wash hands after use. Training (job specific / general OHS induction): General university induction, specific lab induction and machine training required.

**Administrative Controls:**

Effective and maintained well

**Effectiveness:**

 See Administrative controls

**Training Controls:**

Effective and maintained well

**Effectiveness:**

Gloves: Nitrile or latex (when directly handling mounted material) Eye protection: Required use with hazardous chemicals/ samples when not in sealed containers. Coat/apron: Required when handling hazardous chemicals/ samples not in sealed containers. Footwear: Enclosed shoes (required in all lab areas) Respirator: For spills of powder outside fumehood ‑ P2 particle mask NB: Masks provide minimal protection from dust.

**PPE Controls:**

Effective and maintained well

**Effectiveness:**

**Waste Disposal:**

Small amounts of waste may be generated in this process. Material returned to lab of origin. SPILLS: Notify/ alert people in surrounding areas. Notify staff. Clean up only if safe to do so. Mounted material (minimal or no loose material): Wear PPE. Pick up and place in labelled, sealed plastic bag/container. Avoid generating dust. Unmounted material (e.g. powders): Wear PPE (including P2 mask). Avoid generating dust. Use wet clean up procedures i.e. absorb material with wet paper towelling or absorbent pads. Clean residue with water. Place spill and contaminated material in labelled sealed plastic container/bag in fumehood. Dispose of lightly contaminated PPE (masks and gloves) in sealed plastic bag in clinical waste stream.

**Storage Incompatibilities:**

Unknown for nanoparticles ‑ take bulk chemical properties into account.

**Safety Instructions:**

Bulk properties may not be an accurate indicator of nanoparticle health effects. Treat nanoparticles as hazardous material until proven otherwise. First Aid: Treat symptomatically. If contamination occurs wash affected area with water and remove contaminated clothing as a precautionary measure.

**Risk Determination**

**Health Surveillance Req:**

**Air Monitoring:**

**Exposure Frequency:**

**Risk Level:**

No

**Significant but controlled**

Unusual

No

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