

Risk Assessment: Preparation, Use and Cleaning of NMR Samples

Hazards	Who Might be Harmed and How?	Existing Control Measures	Further Actions Required	Responsible Person	Date
Exposure to deuterated organic solvents	<i>Research staff preparing, analysing and disposing of NMR samples. Estates staff or contractors who access the laboratory for cleaning / maintenance operations.</i> NMR sample preparation requires the use of deuterated solvents such as chloroform, dichloromethane, dimethyl sulfoxide, acetone, methanol and benzene. Exposure via direct contact with skin / eyes may cause irritation. Inhalation of solvent vapour during sample preparation may result in dizziness. Chloroform, dichloromethane and benzene are carcinogens. Chronic exposure by contact or inhalation could result in ill health.	NMR samples are prepared within a fume cupboard to prevent exposure by inhalation. Standard laboratory PPE (including nitrile gloves, safety glasses and laboratory coat) are worn to prevent accidental exposure. Solvent containers remain sealed when not in use. Only small quantities (~1-2 mL) are used for NMR sample preparation helping to limit overall exposure. Waste solvents are collected in sealed, labelled waste containers and removed via an external waste contractor.	No further actions needed at this time, but risk assessment subject to regular review.	N.A.	N.A.

Hazards	Who Might be Harmed and How?	Existing Control Measures	Further Actions Required	Responsible Person	Date
Cuts from broken NMR tubes	<i>Research staff preparing, carrying or cleaning NMR tubes.</i> NMR tubes may fracture during preparation, fitting of caps, transport or cleaning operations causing cuts and puncture wounds.	NMR tubes are visually inspected before use and broken NMR tubes discarded into an appropriate glass bin. Excessive force is avoided when applying or removing plastic caps.	No further actions needed at this time, but risk assessment subject to regular review.	N.A.	N.A.

Hazards	Who Might be Harmed and How?	Existing Control Measures	Further Actions Required	Responsible Person	Date
Exposure to strong acids during the cleaning of NMR tubes	<i>Research staff cleaning NMR tubes.</i> Cleaning NMR tubes of organic material may require the use of strong acids. If the strong acid reacts with organic material, there is a potential for the solution to spray resulting in burns and eye injuries	Where possible, heavily contaminated NMR tubes are discarded to eliminate the risk of working with strong acids. If strong acids are used, acid-resistant gloves and a face shield will be used to prevent direct contact of acids with the skin / eyes	No further actions needed at this time, but risk assessment subject to regular review.	N.A.	N.A.

Hazards	Who Might be Harmed and How?	Existing Control Measures	Further Actions Required	Responsible Person	Date
Exposure to unknown or hazardous sample contents	<i>Research staff preparing, carrying and cleaning NMR tubes.</i> NMR samples are typically prepared to determine the structure of novel research chemicals. The hazards associated with novel compounds are unknown and may be toxic, carcinogenic or irritating by inhalation or direct contact.	Samples are prepared in a fume cupboard whilst wearing appropriate PPE (laboratory coat, safety glasses and disposable nitrile gloves) to prevent accidental exposure. Where possible, NMR tubes are transported in secondary containment to help prevent breakages if the material is dropped during transport and confine spillages to a container that can be easily cleaned.	No further actions needed at this time, but risk assessment subject to regular review.	N.A.	N.A.

Assessment Carried Out by: Dr Kevin Jones

Date of Assessment: 13/07/2026

Training Requirements:

Only general laboratory training is required for this operation

Specialised Emergency Response (if required):

In the event an NMR tube breaks and spills its contents, the material can be absorbed with paper towel that can be taken to a laboratory for disposal

Version Control:

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1.0	Original Document	Published	Kevin Jones, Chemistry	15/07/2026