

<b>Title of project/experiment/activity</b> Use of ultrasonication baths			
<b>Location of activity</b> EEDBA Annexe : Chemistry Lab		<b>Start and end dates</b> 24/08/2015 - continuous	
<p><b>Brief description (or attach procedure/protocol)</b>                  In a bath sonicator, a high frequency electrical energy is converted into ultrasound waves by means of ultrasonic transducers, which are bonded on the base of a water tank. The cavitation which is caused by the drop of local pressure generates turbulent flow and high shear leading to particle size reduction, deagglomeration or exfoliation. Bath sonicators are in EEDBA Chemistry Lab and are used to exfoliate layered nanomaterials from bulk materials.</p> <p>Containers are securely sealed and properly placed in the sonicators. A container should be available near to the sonicator in order to drain it, in case of bottle breakage containing nanomaterials or solvents.</p> <p>The temperature of the water bath is maintained by an external chiller or ice cubes are applied regularly.</p>			
Hazard	Effect	Control measures	Residual risk
General hazards in lab	Inhalation of solvents Exposure to chemicals harmful to health	Other lab users will be using solvents with appropriate extraction in place. (Likelihood: 1, Severity: 1)  Gloves, eye protection and lab coat must be worn whilst in the laboratory. The Chemistry Lab rules will be respected.	Low risk
Ultrasound (kHz)	Exposure to noise Ultrasonic wave shock	Avoid contact with water during operation. Always use bath with sufficient water to reduce noise Switch off sonic function key before placing/removing samples (Likelihood: 1, Severity: 1)	Low risk
Electric shock	Shock to user, damage to equipment	Do not get outer parts of sonication baths wet Always fill and empty the baths using the hoses provided. Hold hose firmly in bath when filling. (Likelihood: 1, Severity: 1)	Low risk

**Personal Protective Equipment required** [eye/face protection, respiratory protection, gloves, lab coat etc]

Lab coat, gloves (purple nitrile) and eye protection (safety specs) required in the lab at all times

**Emergency Instructions & First Aid**

**Spillage:**

Solvent spillage or water-based dispersion spillage should not be more than 60 mL, and can be dealt by wiping with cleanroom wipes. The wipes disposed into waste bins or should be left to dry (in the case of solvent spillage) in the

solvent fume cupboard prior to disposal into waste bins.

**Fire:**

In case of fire, the fire alarm should be sounded and fire service called. If safe to do so, the fire may be extinguished using an extinguisher containing carbon dioxide, located in the corridor outside the laboratory.

**First aid:**

General advice: Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact: Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**Any special monitoring required [e.g. hearing test, vibration monitoring, health surveillance]**

No

**Further control measures required? If yes, list with actions.**

Waste Disposal Procedures: Aqueous waste should be disposed in a container separate from solvent waste. Solvents will be disposed of in suitable chlorinated (e.g. DCB, chloroform), or non-chlorinated (all others) waste containers.

In the case of equipment malfunction/failure: shutdown instrument and chiller from power buttons or directly from plug socket.

**Biological/Laser/Radiation Approval [requires relevant Specialist Safety Officer signature and date]**

N/A

**Out of hours/Lone working**


The system can be used overnight.



Signature to confirm that this is a suitable and sufficient assessment of risk and that stated control measures are in place. This risk assessment should be reviewed if additional risks not covered in this assessment are identified or if there is any reason to indicate that the control measures are insufficient.

<p><b>Name of Assessor</b> Dr. Stephen Hodge Email: sah211@cam.ac.uk</p>	<p><b>Signature</b> </p>	<p><b>Date</b> 24/8/15</p>
<p><b>Name of Supervisor</b></p>	<p><b>Signature</b></p>	<p><b>Date</b></p>

Department of Engineering – Risk Assessment

Ref No. 3948

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Local Safety Coordinator	Signature 	Date 24/8/15
Departmental Safety Office <b>IAN SLACK</b>	Signature 	Date 24 APR 2017