

Title of project/experiment/activity			
Use of freeze drier			
Location of activity Cambridge Graphene Centre : Chemistry Lab		Start and end dates 2015/11-continuous	
Brief description (or attach procedure/protocol)			
<p>Freeze drying is a dehydration process typically used to preserve a perishable material or make the material more convenient for transport. Freeze-drying works by freezing the material and then reducing the surrounding pressure to allow the frozen water in the material to sublime directly from the solid phase to the gas phase.</p> <p>The machine consists of two main parts: the vacuum system (a pump) and benchtop freeze drying box with a low temperature refrigerator.</p> <p>The freeze drying process usually contains (1) prefreeze in low temperature refrigerator or in liquid nitrogen; (2) Pre-cooling the machine; (3) Place sample into the bracket and start pump to form evacuation; (4) After drying, open the valve to let air inflate the system very slowly; (5) Get the sample after the pressure balance.</p> <p>In the prefreeze process by liquid nitrogen, it may cause freezing injury by long time contact of liquid nitrogen or some metal part of liquid nitrogen container. Wear long sleeve shirts and trousers, and close shoes, and thermal insulating gloves when handling the liquid nitrogen.</p> <p>The LyoQuest freeze drier is a commercially made system and will be used in accordance with the manufacturer's instructions.</p>			
Hazard	Effect	Control measures	Residual risk
Liquid Nitrogen	Can cause rapid suffocation. Can cause severe frostbite.	<ol style="list-style-type: none"> 1. Never allow any unprotected part of the body to touch un-insulated pipes or vessels that contain cryogenic fluids. 2. Put on loose fitting thermal insulated or leather gloves 3. Wear long sleeve shirts and trousers, and close shoes. Do not exposure skin when handling liquid nitrogen 	Low risk
Taking out samples	Can form fluffy dust in the air	<ol style="list-style-type: none"> 1. open the valve to let air inflate the system very slowly; 2. Wear gloves and mask 	Low risk

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

Thermal insulating Gloves, Mask, Glasses.

Emergency Instructions & First Aid

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. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. 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.

NO

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



N/A

Out of hours/Lone working

Out of hours/lone working permitted if authorised by Supervisor.

Rajiv H/D permission

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.

Name of Assessor Dr. Stephen Hodge Email: sah211@cam.ac.uk	Signature 	Date 2/8/16
Name of Supervisor Prof A.C. Ferrari Email: acf26@cam.ac.uk	Signature 	Date 2/8/16
Local Safety Coordinator	Signature 	Date 13/4/17
Departmental Safety Office IAN SLACK	Signature 	Date 24 APR 2017