Department of Engineering – Risk Assessment Ref No. B884

Title of project/experiment/activity Use of the UV-VIS-NIR spectrometer	
Location of activity Cambridge Graphene Centre : PLE lab	**Start and end dates** 24/05/2016 - continuous

Brief description (or attach procedure/protocol)

The Agilent Cary 7000 is a commercially made optical spectrometer and will be used in accordance with the manufacturer's instructions after training. The spectrometer is used to measure the absorption, transmittance and reflectance of graphene and related materials in dispersion in different solvents and aqueous solutions as well as in the form of thin films. The measurements in liquid state requires 1-2 ml of the dispersion, a quartz cuvette close with a lid is used inside the chamber of the instrument.
The machine operates between 175-3300 nm is equipped with two lamps:
Deuterium covering the UV and part of the visible
Tungsten covering VIS and NIR.

Hazard	Effect	Control measures	Residual risk
General hazards in lab	Inhalation of solvents Exposure to chemicals harmful to health	The volumes up to 2 ml of water or solvent based dispersions are used. The solvent is transferred into the cuvette inside the fume cupboard and close with the lid to avoid the evaporation. (Likelihood: 1, Severity: 1) The use of various chemicals will be covered in separated risks assessments dealing with the preparation of nanomaterials inks and COSSH forms. Gloves, eye protection and lab coat must be worn whilst in the laboratory. The PLE Lab rules will be respected.	Low risk
Optical radiation hazard	Exposure to the optical radiation of the lamps harmful to the surface of the eyes	The lamps are fully enclosed inside the spectrometer.	Low risk
Electric shock	Shock to user, damage to equipment	Always wipe any potential leakage on or around the spectrometer (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

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Emergency Instructions & First Aid

Spillage:
Spillage can be dealt with using a standard spill kit or clean room wipes.

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 outside the laboratory in the corridor.

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: At the end of the measurement, the dispersion in the cuvette is disposed in the appropriate waste bottle inside the fume cupboard

In the case of equipment malfunction/failure: shutdown instrument from emergency stop (red) button or directly from plug socket.

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

Out of hours/Lone working
N/A

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 Flavia Tomarchio Email: ft272@cam.ac.uk	**Signature** Flavia Tomarchio	**Date** 6/9/16
Name of Supervisor	**Signature**	**Date**

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Local Safety Coordinator	**Signature** David Hardie	**Date** 31/10/16
Departmental Safety Office IAN SLACK	**Signature**	**Date** 9 NOV 2016