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Ultra Violet Light Sources

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Introduction

Gel documentation and imaging systems have replaced the majority of UV trans-illuminators in departments where DNA work is routinely undertaken. However there may still be a requirement to visualise and excise gel bands using a trans-illuminator. Handheld ultra violet lamps are used for visualising bands on thin layer chromatography plates.

The ultra violet light emitted represents a significant hazard to the user. All radiation of wavelength shorter than 250nm should be considered dangerous.

Other sources of ultra violet radiation are microbiological safety cabinets fitted with UV bulbs and UV microscopes.

All users of UV equipment must be trained in the use of the equipment and be made aware of the hazards involved. No-one is allowed to use such equipment unsupervised until deemed competent.

Hazards

- Damage to eyes caused by exposure to UV radiation
- Damage to skin caused by exposure to UV radiation
- Burns to skin caused by contact with a hot UV lamp
- Fire hazard represented by hot UV lamp
- Explosion of UV microscope bulbs and exposure to mercury deposits.

Precautions

Gel documentation systems

- UV light sources in gel doc systems are enclosed and their operation is interlocked with the closure of the chamber door.
- Interlocks must be checked regularly as part of the maintenance or servicing contract.
- Interlocks must not be disabled for any reason.

Trans-illuminators

- UV trans-illuminators should be used in a dedicated room and the door should be kept closed to prevent passers by from inadvertent exposure to the radiation. Where necessary warning signs should be posted.
- All UV opaque lids and covers must be used in accordance with the manufacturer's instructions.
- A full face UV protective shield must be worn at all times when the UV source is illuminated. The shield must be carefully selected to ensure that it is fit for purpose and suitable for UV protection. The face shield should be checked monthly for cleanliness and defects and records kept in the monthly safety audit. Defects must be reported to the Departmental Safety Officer.
- Lab coats sleeves must be pulled down fully to cover the arms and prevent exposure to UV radiation.
- Nitrile gloves should be worn to protect the hands from UV radiation.

Hand held UV lamps

- Avoid prolonged exposure to these sources and use in an area that prevents potential exposure of co-workers, preferably in a dedicated room.
- Usage of hand held UV lamps is not allowed until training has been received and users must be supervised until deemed competent.
- Warning signs must be posted when the lamp is in use.
- Wear protective PPE as detailed above. Face shields must be checked monthly for cleanliness and defects and records kept in the monthly safety audit. Defects must be reported to the Departmental Safety Officer.
- Use the lamp in accordance with the manufacturer's instructions.
- Do not use in fume cupboards unless all chemicals have been removed, due to the heat generated.

Microbiological Safety Cabinets and UV lamps

- Do not switch on the UV light in the safety cabinet while you are working.
- Close all screens and night doors while the UV light is operational.
- Post warning signs to alert co-workers that the UV lamp is in use.

UV microscopes

Full training must be given before UV microscopes can be used.

In general however:

- Manufacturer's guidelines for the use of UV burners / lamps must be adhered to.
- Strict logs must be maintained for lamp usage and the recommended maximum life must not be exceeded, to prevent explosive failure.
- Correct filter combinations must be used to ensure that the eyes are not exposed to stray UV light.
- The UV bulb must run for at least 30 minutes before it is turned off. Do not switch on again for 30 minutes to allow the bulb casing to cool completely.
- Bulb explosions are extremely rare but in the event that this should occur you should leave the room immediately and evacuate other workers in the vicinity. The room should be ventilated for at least 30 minutes and any mercury deposits cleaned up in accordance with the procedures for handling a chemical spill (see OCDEM SOP2).

Review history				
Version	Date	Reason for update	Updated by:	Date next review due:
1	3 January 2007	New assessment	Assessor: SMH	Jan 2009
1.1	3 April 2007	Minor changes	SMH	April 2009
1.1	30 April 2009	Reviewed, no changes	SMH	April 2011
1.1	1 st June 2012	Reviewed – no changes	SMH	June 2014
1.2	1 st June 2014	Header changed – no other changes	SMH	June 2016
2.0	26 th July 2016	HoD and ToC added	SMH	July 2018