



**BORANG KAWALAN BAHAN HAZARD KEPADA KESIHATAN
DAN PENAKSIRAN RISIKO**
(*CONTROL OF SUBSTANCE HAZARDOUS TO HEALTH (COSHH) & RISK ASSESSMENT*)

Kawalan Bahan Hazard Kepada Kesihatan (COSHH) dan penilaian risiko diperlukan untuk mengendali bahan berbahaya termasuk bahan-bahan sumber, produk, bahan perantaraan yang diketahui dan hasil-hasil sampingan. Semua bahan yang hendak digunakan di dalam makmal mestilah diakui dari segi tahap keselamatan dan kesihatan.

Borang perlu diisi dan ditandatangani oleh orang yang bertanggungjawab. Sebelum mengisi borang ini, sila rujuk kepada Safety Data Sheet (SDS) untuk maklumat terperinci.

Individu Bertanggungjawab	AHMAD BIN JUSOH		
No. Matriks/ No.IC	GSK2400	No. Tel	014-7758274
Program Pengajian	Master of Science	Semester/Sesi	3/2017
Tajuk Projek	Study on morphology of fish parasites in Kenyir Fresh Water		
Lokasi Kerja (Nama Makmal)	MAKMAL PERSEDIAAN SEM - BIOLOGI		

Bahagian 1 : Projek/Aktiviti

1.1 : Keterangan Ringkas Projek/Aktiviti (atau lampirkan kaedah kerja)

Method: SEM Biological Preparation (Parasites)

1. Fixation in 2.5% glutaraldehyde in 0.1M sodium cacodylate buffer at room temp. for 1-2 hours
2. Rinse in 0.1M sodium cacodylate buffer at room temp for 10 – 15 min, 3 times
3. Post-fixation in 1% osmium tetroxide in 0.1M sodium cacodylate buffer in room temp. for 1-2 hours
4. Rinse in 0.1M sodium cacodylate buffer in room temp. for 10 – 15 min, 3 times
5. Dehydration at (35%, 50%, 60%, 70%, 80%, 90%, 95%)- 10 minute for each concentration and 100% ethanol (10minute, 2 times)
6. Hexamethyldisilazane(HMDS) / Air Dry
7. Mount on specimen stub with carbon/double sided
8. Coat with gold using Auto Fine Coater/Vacuum Evaporator
9. Observation by Analytical Scanning Electron Microscope Model JEOL6360LA

Bahagian 2: Maklumat Kesan Kesihatan & Keselamatan

Nama Bahan	Pernyataan Hazard (Hazard Statement)	Pernyataan Langkah Berjaga-jaga (Precaution Statement)	*Label Bahaya (Pictogram)	Maklumat Toksikologi (sangat beracun, karsinogen / mutagen / teratogenik / akut dan lain-lain)	Cadangan Penyimpanan Selamat (Recommendation for Safe Storage)
Gluteraldyhde	Combustible liquid. Harmful if swallowed, in contact with skin or if inhaled. Causes severe skin burns and eye damage	Keep away from flames and hot surfaces. Contaminated work clothing must not be allowed out of the workplace.	5, 6, 8	Karsinogen	Store in a well-ventilated place. Keep container tightly closed. Keep cool.
Sodium Cacodylate	Toxic if swallowed.	Wash thoroughly after handling. Do not eat, drink or smoke when using this product. If swallowed: Immediately call a poison center/doctor. Specific treatment. Rinse mouth	7	Sangat Beracun	Store in a well-ventilated place. Keep container tightly closed
Osmium Tetraoxide	Fatal if swallowed, in contact with skin or if inhaled. Causes severe skin burns and eye damage	Do not breathe dusts or mists. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling	7, 6	Toksik akut	Store in a well-ventilated place. Keep container tightly closed.
Ethanol	Keep container in a well-ventilated place. Keep away from heat. Keep away from sources of ignition - No smoking.	Keep ignition sources away - Do not smoke. Protect from heat. Protect against electrostatic charges.	2, 5, 8	Karsinogen	Store in cool, dry conditions in well sealed receptacles. Protect from heat and direct sunlight.
Hexamethyldisilazane (HMDS)	Highly flammable liquid and vapor. Toxic if swallowed. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation.	Keep away from heat/sparks/open flames/hot surfaces.	1, 7, 8	Sangat Beracun	Keep receptacle tightly sealed. Store in cool, dry conditions in well sealed receptacles. Protect from heat and direct sunlight.

*Nota: Label Bahaya (Pictogram)

1. 	2. 	3. 	4. 	5. 	6. 	7. 	8. 	9. 
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Bahagian 3: Penilaian & Kawalan Risiko

3.1 Kaedah Penilaian Risiko Kuantitatif

**Indeks Risiko = Frekuensi Pendedahan x Tahap Keterukan jika berlaku kemalangan
(samada terdedah/Contact/kerosakan fizikal)**

Nama Bahan	Tahap Pendedahan	Keterukan	Indeks Risiko	Tahap Risiko (Low/Medium/High)
Gluteraldyhde	2	3	6	Low
Sodium Cacodylate	2	2	4	Low
Osmium Tetraoxide	2	4	8	Medium
Ethanol	2	1	2	Low
Hexamethyldisilazane (HMDS)	2	2	4	Low

Note: Frekuensi Pendedahan

- 1 – Sangat rendah (sekali setahun)
- 2 – Rendah (bulanan)
- 3 – Tinggi (Mingguan)
- 4 – Sangat tinggi (setiap hari)

Tahap Keterukan jika berlaku kemalangan

- 1 – Tiada Kesan/Tidak Memudaratkan
- 2 – Merengsa/Pedih Mata/Loya
- 3 – Pening/Muntah/Mengkakis/Pengsan/Kebakaran/letupan
- 4 – Sesak Nafas/Maut/Lumpuh Kekal/Karsinogenik/Tetratogenik/Mutagenik/

Indeks Risiko & Tahap Risiko

- 1 – 6 (Low)
- 7 – 12 (Medium)
- 13 – 16 (High)

3.2 Hierarki Kawalan Risiko (Untuk Tahap Risiko Tinggi dan Sederhana Sahaja) –Rujuk Kepada Bahagian 3.1

Bahan-bahan Kimia dan Hazard	Hierarki Kawalan (Sila Tanda)						Catatan (Note)
	Penghapusan (Elimination)	Penggantian (Substitution)	Pengasingan (Isolation)	Kawalan Kejuruteraan (Engineering Control)	Kawalan Pengurusan (Management Control)	Personal Protective Equipment (PPE)	
Gluteraldyhde				Fumehood	SOP/latihan	Labcoat Glove Goggle Mask	
Sodium Cacodylate				Fumehood	SOP/latihan	Labcoat Glove Goggle Mask	
Osmium Tetraoxide				Fumehood	SOP/latihan	Labcoat Glove Goggle Mask	
Ethanol				Fumehood	SOP/latihan	Labcoat Glove Goggle Mask	
Hexamethyldisilazane (HMDS)				Fumehood	SOP/latihan	Labcoat Glove Goggle Mask	

Bahagian 4: Tindakan Kecemasan

Bahan-bahan Kimia	Tumpahan	Kontek Pada Badan	Fire Fighting
	Prosedur rawatan/pembersihan	Tindakan jika terkena: a) Kulit: b) Penyedutan : c) Mata : d) Tertelan :	Extinguisher media: Karbon dioksida/Serbuk cecair/ Buih/ Lain-lain
Gluteraldyhde	Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).Use neutralizing agent.	a) Kulit: Immediately wash with water and soap and rinse thoroughly. b) Penyedutan : Supply fresh air and to be sure call for a doctor c) Mata : Rinse opened eye for several minutes under running water. Then consult a doctor. d) Tertelan : Drink copious amounts of water and provide fresh air. Immediately call a doctor	CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam
Sodium Cacodylate	Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).	a) Kulit: Immediately wash with water and soap and rinse thoroughly. b) Penyedutan : In case of unconsciousness place patient stably in side position for transportation. c) Mata : Rinse opened eye for several minutes under running water. d) Tertelan : Immediately call a doctor.	CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam
Osmium Tetraoxide	Wear protective equipment. Use neutralizing agent. Ensure adequate ventilation.	a) Kulit: Immediately wash with water and soap and rinse thoroughly. b) Penyedutan : Supply fresh air or oxygen; call for doctor. c) Mata : Rinse opened eye for several minutes under running water. Then consult a doctor. d) Tertelan : Do not induce vomiting; immediately call for medical help.Drink copious amounts of water and provide fresh air. Immediately call a doctor.	CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Ethanol	Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Ensure adequate ventilation.	a) Kulit: Generally the product does not irritate the skin. b) Penyedutan : Supply fresh air; consult doctor in case of complaints. c) Mata : Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor. d) Tertelan : If symptoms persist consult doctor.	CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Hexamethyldisilazane (HMDS)	Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Ensure adequate ventilation. Do not flush with water or aqueous cleansing agents	a) Kulit: Immediately wash with water and soap and rinse thoroughly. b) Penyedutan : In case of unconsciousness place patient stably in side position for transportation. c) Mata : Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor. d) Tertelan : Do not induce vomiting; immediately call for medical help.	CO ₂ , sand, extinguishing powder. Do not use water
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Nota:

- 1) Tumpahan Major – Limpahan bahan kimia melebihi 2.5L , laporkan kepada kakitangan
- 2) Tumpahan Minor – Limpahan bahan kimia tidak melebihi 2.5L Prosedur pembersihan ringkas

Bahagian 5: Individu Untuk Dihubungi Sewaktu Kecemasan

Nama	Alamat	No. Telefon	Hubungan

Bahagian 6: Kelulusan

Individu Bertanggungjawab	Penyelia Projek	Pegawai Makmal
Disediakan Oleh:	Disahkan Oleh:	Diluluskan Oleh :
Tandatangan:	Tandatangan:	Tandatangan :
Tarikh:	Tarikh :	Tarikh :

***Nota: Prosedur pengendalian khas untuk cyanide & mercury (Sila maklumkan kepada Pegawai di makmal berkaitan)**