

HEADING

Title of Procedure: *Electrophoresis of RNA through Gels Containing Formaldehyde*^a Revision Date: _____

Author (P.I., See Citation, Lab Investigator, Others):

Name: _____ Signature: _____

Name: _____ Signature: _____

Name: _____ Signature: _____

Reviewed by CHO/Safety Representative for Lab:

Name: _____ Signature: _____

SCOPE AND APPLICABILITY

- Department: _____
- Research Group: _____
- Lab Bldg., Room(s): _____
- Operation / Experiment: _____
- Material(s): _____
- Ventilation: General room Chemical fume hood Biosafety cabinet (A/B3, B2, B1)
 Snorkel Trunk Glove box (BSC Class III)

MATERIALS AND HAZARDS

Principal Materials Used	Corrosive	Irritant	Sensitizer	Reproductive toxin	Acutely Toxic	Carcinogen	Flammable	Combustible	Water-Reactive	Shock-Sensitive	Pyrophoric	Oxidizer	Biotoxin	Other Comments:
Formaldehyde	X	X		X	X	X		X						See below 1.
10X MOPS (pH=7)														
MOPS		X												
Sodium acetate		X						X						
EDTA		X												
2N Sodium hydroxide	X	X												
Agarose		X												
Ethidium bromide		X		X										See below 2.
Formamide		X												See below 3.
Ultraviolet (UV) light														See below 4.

MSDS attached: Yes No If not, explain: (e.g. MSDSs are available at the following location: shelf in Room 1234, Building XYZ; electronically via EHS Department's Web page)

Describe equipment/instrumentation used to monitor/control hazards:

- ♦ The operations should be performed in a laboratory or chemical fume hood.
- ♦ The ultraviolet light source should be adequately shielded.

Other comments, Chemical hazards, Precautions:

1. May cause sensitization. Formaldehyde is toxic through skin contact and inhalation of vapors. All operations involving formaldehyde should be carried out in a fume hood, and electrophoresis tanks containing formaldehyde solutions should be kept covered whenever possible. Gels containing formaldehyde are less rigid than nondenaturing agarose gels, and care must be exercised in handling them.

MATERIALS AND HAZARDS (CONT.)

- Ethidium bromide is a powerful mutagen and is moderately toxic and therefore should be regarded as a possible carcinogen and reproductive toxin. Gloves should be worn when working with solutions that contain this dye. After use, these solutions should be decontaminated.
- Formamide can be absorbed through skin. Prolonged or repeated exposure may cause adverse reproductive effects. May cause fetal effects.
- Short wave ultraviolet radiation will harm your eyes and skin. Do not observe gels unless the UV shield is in place over the transilluminator. UV-light protective goggles, full-face shields, long-sleeve protective clothing and gloves should be worn for protection as a function of the range of UV (i.e. UVA, UVB, UVC).
- Container can be hot after microwaving. Consider wearing gloves when removing it from the microwave (e.g., cotton gloves, leather gloves).

Special PPE Required:

- Safety glasses
- Goggles (chemical-splash goggles; UV light protective goggles)
- Face Shield
- Chemical Resistant Apron/Smock/Lab Coat
- Protective Clothing (e.g. sleeves, footwear, head cover)
- Gloves/Gauntlets
 - Single
 - Double
- Respirator (If yes, contact EH&S for additional assistance)

Special Protective Clothing Required:

Protective Clothing	Nitrile	PVC (Vinyl)	PVA	Latex	Neoprene	Butyl	Additional Specifications
Aprons/Lab coat/Smock							<ul style="list-style-type: none"> ◆ PE, PVC ◆ Avoid traditional cotton-polyester white lab coat
Shoe Cover							<ul style="list-style-type: none"> ◆ Impervious boots or PVC disposable shoe coverings are recommended.
Full Body Cover							
Head Cover							
Gloves/Gauntlets							<ul style="list-style-type: none"> ◆ Gloves should be worn when preparing and handling the gel solutions. ◆ Gloves are for splash protection; not for immersion protection. ◆ Double-gloving is recommended, given the diversity of chemical hazards. Double-glove with different types and colors of gloves is recommended for best protection. ◆ Immediately replace with new gloves when splash occurs.
Formaldehyde	X				X		
MOPS*							
Sodium acetate		X			X		
EDTA				X			
Sodium hydroxide				X	X	X	
Agarose		X		X	X		
Ethidium bromide*							
Formamide						X	

*MSDS suggests without qualification "rubber gloves."

NOTE: If special PPE and/or protective clothing is not required, standard PPE and protective clothing required in Part II of the Harvard University CHP must be utilized.

SPECIAL PRECAUTIONS

- Permits: (e.g. FDA, ATF, NIH, other) _____
- Mgmt. Approval: _____
- Training: _____
- Medical Surveillance: _____
- Other: _____

PROCEDURE

Attach the enumerated or bulleted steps to be followed in performing the procedure/protocol. The steps should be detailed and should include prohibited activities and cautionary statements, where applicable.

SPECIAL EMERGENCY PROCEDURES

Also, see emergency flip chart titled “EHS Procedures and Response Guidelines,” posted in each laboratory.

Fire/Evacuation: _____

Chemical Spill: _____

Medical Emergency: _____

Personal Exposure: _____

References:

- a. J. Sambrook, E. F. Fritsch, T. Maniatis, “Electrophoresis of RNA through Gels Containing Formaldehyde,” *Molecular Cloning: A Laboratory Manual, 2nd ed.*, Cold Spring Harbor Laboratory Press, 1989, p.7.43-45.
- b. J. Sambrook, E. F. Fritsch, T. Maniatis, “Decontamination of Ethidium Bromide Solutions,” *Molecular Cloning: A Laboratory Manual, 2nd ed.*, Cold Spring Harbor Laboratory Press, 1989, p.E.8-9.