

Preparation and Use of Tribromoethanol (aka Avertin or TBE)

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Background:

Tribromoethanol (aka Avertin or TBE) is an anesthesia that is sometimes recommended for manipulations required for the production of genetically engineered mice and rats. DLAR veterinarians recommend inhalant isoflurane or injectable ketamine/xylazine if not contra indicated by research objectives. In the past, Tribromoethanol was available as a prepared pharmaceutical grade anesthetic, however it has been discontinued and now must be prepared by the investigator.

Tribromoethanol is not recommended by DLAR for repeated anesthesia. The duration of anesthesia is relatively short (15-30 minutes) but can vary considerably with body composition, strain and sex of the animal. TBE has been reported to cause peritonitis, abdominal adhesions, ileus and death.

Purpose:

These veterinary recommendations are to assist the investigator in the preparation, storage and use of Tribromoethanol. There are many recipes for and instructions regarding TBE available at multiple sites in textbooks and on the Internet.

Materials:

- Avertin (2,2,2, tribromoethanol)
- Tert-amyl alcohol
- Aluminum foil
- Light excluding glass bottles (dark glass)
- 0.2 micron filter
- Nitrile or latex exam gloves (wear gloves at all times when preparing this solution.)

Procedure

Making the Stock solution (1.6 g/ml)

1. Add 6.2 ml T-amyl alcohol to 10 g. avertin in dark bottle (the bottle that the avertin is shipped in works great). You may also follow these directions using 15.5 ml T-amyl alcohol and 25g. avertin.
2. Stir on magnetic stirrer until the avertin is dissolved (about 12 hours—heating to approx 40°C helps dissolve the avertin).
3. Avertin stock is light sensitive and hygroscopic. Keep in dark bottle at RT (If the solution is kept refrigerated the avertin will "freeze" out, necessitating re-dissolving the avertin), away from light and tightly sealed.
4. Do not leave the bottle open longer than necessary.

Making the Working solution (20 mg/ml)

1. Mix 0.5 ml avertin stock solution and 39.5 ml normal saline in glass vessel or bottle.
2. Seal container and then wrap in foil to exclude light and stir on magnetic stirrer for about 12 hours or until dissolved.
3. Filter sterilize through 0.2 micron filter and store at 4°C in foil wrapped, sterile vials or kept in a dark, capped bottle. The working solution has a two week safe use time limit.
4. Dispose of any solution that is past the two week expiration date, has any precipitated crystals or has changed from a clear solution to a yellow solution.

Dosages :

Mouse: 125-300 mg/kg IP

Rat: 300 mg/kg IP or 150mg/kg if used with medetomidine 0.5 mg/kg IP

Notes:

- The stock avertin solution is quite stable at room temperature. However DLAR recommends keeping this stock solution refrigerated. Yellowing of the solution indicates oxidation products and the stock must be replaced.
- Working solutions must be kept in a dark bottle until use.
- Before use warm the solution gently to room temperature and make sure there have been no crystals formed in solution.
- Replace the working solution with fresh every two weeks.
- Toxic decomposition products (dibromoacetic aldehyde and hydrobromic acid) can occur when Avertin is improperly prepared and/or stored. Do not use any working solution that has been kept at room temperature for prolonged periods, is discolored, and/or has any evidence of a precipitate.
- Dispose of expired TBE as chemical waste.

References:

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