URETHANE CHEMICAL SAFETY SOP

Urethane is used alone or in combination with other drugs to produce anesthesia in laboratory animals. It is known to provide long periods of anesthesia with minimal physiological changes. However, due to the potential health risks of urethane, it should be used with care.

Urethane has demonstrated carcinogenic properties when administered to rats and mice as well as mutagenic properties in mice, when administered at anesthetic dosages. Due to the long term carcinogenic effects in laboratory animals, urethane should be limited in use to non-recovery procedures.

Urethane is well absorbed across the skin, shows multiple organ effects, suppresses the bone marrow, readily crosses the placenta, induces tumor formation in fetuses exposed in utero, and initiatespreneoplastic changes in skin.

Very little scientific information has been published regarding the metabolization and resulting metabolic products of urethane. According to one study, urethane is metabolized to ammonia, carbon dioxide, and ethyl alcohol (Bryan et al., 1957). Most carbon associated with urethane is eliminated through exhalation as carbon dioxide (90%) with another 5-10% eliminated in urine as ammonia and other carbon compounds (Bryan et al., 1957). Additional research indicates that during the metabolic process, urethane breaks down to urea and water within hours of dosing, leading to urine, feces, and bedding waste which does not have hazardous characteristics (MIT, 2005). Based upon the limited available information, it is acceptable to dispose of bedding materials generated following administration of urethane anesthesia under normal procedures and circumstances as non-hazardous waste, provided that other chemical or biological hazards are not suspected or known to be present within the bedding.

The following precautions should be taken to promote safe handling of the compound:

1. When handling urethane in crystalline or powdered form and when mixing urethane into aqueous solutions, always wear a face mask, protective eye-wear, and nitrile gloves.
2. In order to prevent inhaling the volatized drug, mix urethane in a fume hood. Urethane should only be heated if mixing takes place in a fume hood.
3. Nitrile gloves should be worn if the user is to come in contact with blood or serum from an animal anesthetized with urethane.
4. Open containers of urethane are not permitted. Once mixed into an aqueous solution, urethane must be transferred into a sealed bottle. This will prevent volatilization, spillage, and accidental contamination of the environment.
5. Contaminated sharps waste materials and empty containers of urethane should be disposed of in a biohazard sharps container.
6. If accidental contact of the skin, eyes, or other mucous membranes occurs, the area of contamination should be washed thoroughly with water. Repeated transdermal exposure could result in bone marrow suppression.
7. Pregnant women should avoid working with urethane.
8. Carcasses of animals anesthetized or otherwise contaminated with urethane must be disposed of through DAR as regulated medical waste.
9. Consult the Material Safety Data Sheet (MSDS) for additional information.

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