

Use of Dimethyl Sulfoxide (DMSO)

Purpose:

Dimethyl sulfoxide (DMSO) is an organosulfur compound with the formula $(\text{CH}_3)_2\text{SO}$. This colorless liquid is an important polar aprotic solvent that dissolves both polar and nonpolar compounds and is miscible in a wide range of organic solvents as well as water. It penetrates the skin very readily, giving it the unusual property for many individuals of being secreted onto the surface of the tongue after contact with the skin and causing a garlic-like taste in the mouth. In animal research and the medical field, DMSO is often used as a vehicle for a variety of drugs and compounds to facilitate topical absorption. When other substances are dissolved in DMSO and applied to the surface of the skin, it is readily absorbed through the skin, allowing topical absorption of compounds that wouldn't normally have significant dermal penetration.

Precautions:

The following information can be used to complete the Safety section of your animal protocol.

1. Chemical hazard agents – (Identify the category of the chemical): (*Select the following*)
 - Irritant (respiratory/skin/eye)
2. Containment preparation – (Containment equipment required for the preparation of the chemical): (*Select the following*)
 - No special containment needed.
3. Containment animals – (Containment equipment required for chemical administration and handling animals after exposure to the chemical): (*Select the following*)
 - No special containment needed
4. PPE needed - (for handling live animals, carcasses or animal waste/dirty bedding): (*Select the following*)
 - Exam gloves – nitrile
 - Safety glasses/goggles
 - Lab coat or disposable gown
5. Waste Disposal: (disposal of animal waste/dirty bedding from animals after exposure to the chemical) (*Select the following*)
 - No special precautions needed for waste/dirty bedding
6. Carcass disposal: (*Select the following*)
 - Pick up by EH&S for incineration.

7. Chemical human risk: *(Add the following)*

- While DMSO itself has low toxicity and is considered a safe vehicle for drug delivery, it does allow increased dermal absorption of compounds that would not normally have significant dermal penetration and thus should be handled with care. DMSO is a combustible liquid with a flash point of 188⁰ F. Keep away from heat, fire and hot surfaces.

References:

“Medical use of dimethyl sulfoxide (DMSO)”.NIH Jan 1985

<http://www.ncbi.nlm.nih.gov/pubmed/3916302>

“Adverse reactions of dimethyl sulfoxide in humans: a systematic review” NIH 2018

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6707402/>

“DMSO SDS”

<https://www.sigmaaldrich.com/US/en/sds/mm/20-139>