

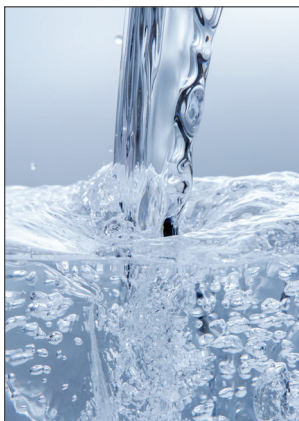
Procipient[®] DMSO (dimethyl sulfoxide USP, Ph.EUR.)

The only grade of DMSO suitable for healthcare and drug delivery applications

Procipient[®]: A versatile pharmaceutical ingredient with high regulatory compliance

Manufactured by Gaylord Chemical, Procipient is both an active pharmaceutical ingredient and a versatile excipient that is widely used in various pharmaceutical and biotechnology applications including:

- Topical and Transdermal Dosage Forms
- Parenteral Drug Delivery & Medical Device Use
- Cryopreservation
- Pharmaceutical Product Processing
- Animal Healthcare formulations
- Enhances Active Pharmaceutical Ingredient (API) solubility



Procipient[®] Characteristics

- Highly purified DMSO with a minimum purity of 99.99%
- Water miscible/extremely polar solvent
- Odorless, clear water-white liquid
- Essentially non-toxic by all routes of administration
- Chemically compatible with other excipients
- Low viscosity (2.0 cP @ 25°C)
- Density similar to water (1.0955 g / mL @ 25°C)
- Low volatility: 189°C boiling point



Extremely Low Toxicity

- DMSO is essentially non-toxic by all routes of administration
- DMSO is well tolerated by oral and dermal route of delivery as well as subcutaneous and intramuscular delivery
- DMSO has a well characterized ADME profile
- Not carcinogenic/mutagenic/teratogenic
- Does not bio-accumulate
- DMSO is oxidized in the body and resulting metabolic products are excreted in the urine



Procipient®: A variety of uses and applications



Topical and Transdermal Dosage Forms

Procipient is a useful excipient in topical and transdermal products for human and animal health. DMSO has been described in new technology to produce anhydrous emulsions for the delivery of hydrolytically unstable drugs, or to provide reservoirs for transdermal delivery systems.

Procipient is a powerful solvent for drugs with low water solubility. The solvent properties of DMSO may allow higher loading of APIs in semisolid products. The low vapor pressure of DMSO enables the formulation to absorb without the skin-chilling effect of excipients such as alcohol. DMSO continues to be evaluated as a penetration enhancer in transdermal formulations.



Parenteral Use

In addition to its role as an API, Procipient is also used as an excipient. DMSO has been used to dissolve polymers that precipitate in situ to form biodegradable implants. This may allow the controlled release of active substances. DMSO may also aid in tissue regeneration.

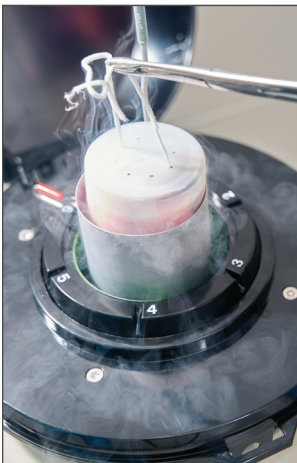
Procipient provides solubility to the API in approved applications. Many innovative applications are currently being evaluated for small volume parenteral products and vaccines.



Procipient as an API and API Adjuvant

As an active pharmaceutical ingredient (API), Procipient is used as a treatment to reduce the swelling and pain of patients suffering from interstitial cystitis. DMSO is used in other parts of the world as an anti-inflammatory in topical products.

Procipient also provides outstanding solubility for an extensive range of APIs.



Cryopreservation

DMSO is well known as a cryopreservation medium. In this role, Procipient enables the long-term cryostorage of cells and biological tissue. It has been used to preserve a variety of cell types, including human bone marrow, ovarian tissue, pancreatic and platelet cells, and hematopoietic stem and progenitor cells.

DMSO transits cell membranes more readily than glycerol.

When combined with water, DMSO exhibits unique and interesting thermodynamic properties. The eutectic mixture remains liquid at minus 80°C, thus preventing cell damage from ice formation while maintaining viability of the cells.



Procipient in Pharmaceutical Product Processing

Procipient is widely utilized as a processing aid for different pharmaceutical applications.

DMSO has high water solubility and has been used for antisolvent methods to disperse a polymer for the formation of microcapsules, for lyophilization/freeze drying, and as a purification medium for peptides and small molecules.



Animal Health

Procipient is used as an excipient in Animal Health drug products.

There are currently several regulated animal health products approved by the US FDA which contain Procipient.

| Chemical Name | Manufacturer | Chemical Type | CAS No. | Molecular Formula |
|---------------|--------------|---------------|---------|----------------------------------|
| Procipient | Gaylord | Excipient | 67-68-5 | C ₂ H ₆ OS |

| Catalog No. | Size | Unit | List Price |
|--------------|--------|-------|-------------|
| 5010-430LT | 1 LT | Each | \$760.00 |
| 5010-430LT | 1 LT | CS(6) | \$3,001.45 |
| 5010-450LT | 4 LT | Each | \$2,505.00 |
| 5010-450LT | 4 LT | CS(4) | \$7,134.37 |
| 5010-510LBBL | 500 LB | Each | \$50,020.00 |



**Gaylord
Chemical
Company, L.L.C.**

Procipient® is the only DMSO product in the world with this level of regulatory support.

Gaylord Chemical's Procipient is manufactured under Good Manufacturing Practices (GMP) conditions following ICH Q7 guidelines, conforming to both the USP and Ph.Eur. (EP) monographs.

Procipient is supported by several regulator dossiers, a Type II Drug Master File with US FDA, a CEP granted by EDQM and a Type I Drug Master File with Health Canada.

spectrum
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Shop now at
SpectrumChemical.com/Procipient



Procipient is a registered trademark of Gaylord Chemical Company, LLC.

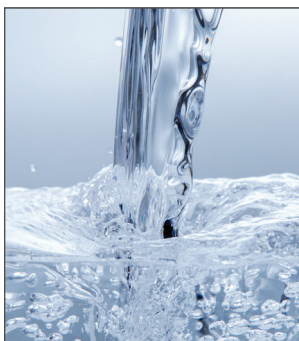
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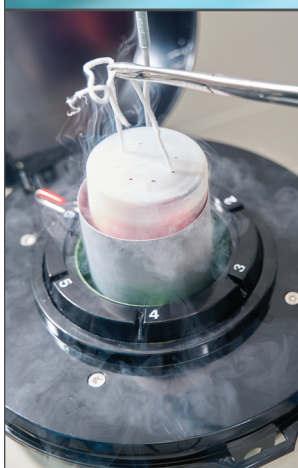
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