TPA (Phorbol-12-Myristate-13-Acetate)

1 ml
(200 µM in 1 ml DMSO)

Description: TPA (12-O-tetradecanoylphorbol-13-acetate) / PMA (phorbol-12-myristate-13-acetate) is soluble in DMSO and ethanol. DMSO solutions can be stored at -20°C, in the absence of light, for at least six months. A 200 nM TPA treatment is standard to induce signaling.

Background: TPA (12-O-tetradecanoylphorbol-13-acetate) / PMA (phorbol-12-myristate-13-acetate) is the most commonly used phorbol ester. It binds and activates protein kinase C, causing a wide range of effects in cells and tissues (1,2). TPA has been demonstrated to be a potent tumor promoter in mouse skin (3). Conversely, it has been shown to be an effective cancer therapeutic agent in myelocytic leukemia patients, and has been indicated as a potential colorectal cancer therapeutic (4-5). TPA has also been shown to increase white blood cell and neutrophil counts in solid tumor cancer patients (6).

Concentration: Supplied as a 200 µM stock in DMSO.

Molecular Formula: C_{36}H_{56}O_{8}

Molecular Weight: 616.84

Directions for Use: TPA is supplied as a 200 µM stock in DMSO. For standard 200 nM treatment, dilute 1000X.

Background References:

Western blot analysis of extracts from serum starved 293 cells, untreated (lane 1), stimulated with TPA treatment (lanes 2 & 3), and treated with CIP and λ phosphatase (lane 3), using Phospho-PKD/PKCµ (Ser916) Antibody #2051 or PKD/PKCµ Antibody #2052.

Western blot analysis of extracts from serum starved 293 cells, untreated (lane 1), stimulated with TPA treatment (lanes 2 & 3), and treated with CIP and λ phosphatase (lane 3), using Phospho-PKC (pan) (βII Ser660) Antibody #9371 or PKCα Antibody #2056.

Storage: Store at -20°C.
Please visit www.cellsignal.com for a complete listing of recommended companion products.

#9905
Store at -20°C
rev. 08/10/09

This product is for in vitro research use only and is not intended for use in humans or animals.
This product is not intended for use as a therapeutic or in diagnostic procedures.

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I. Identification:
Product name: TPA (Phorbol-12-Myristate-13-Acetate) in DMSO
Product Catalog: 9905
CAS#: N/A
Manufacturer Supplier: Cell Signaling Technology
3 Trask Lane
Danvers, MA 01923 USA
978-867-2300 TEL
978-867-2400 FAX
978-578-6737 EMERGENCY TEL

II. Composition/Information:
This product is a mixture of substances. According to OSHA 29 CFR 1910.1200(d), mixtures with hazardous ingredients at less than <1% and carcinogens at less than < 0.1% are considered non-hazardous.

<table>
<thead>
<tr>
<th>Ingredient Name</th>
<th>Synonyms</th>
<th>Percent</th>
<th>CAS#</th>
<th>RTECS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPA</td>
<td>12-O-Tetradecanoylphorbol 13-acetate, TPA, PMA (tumor promoter)</td>
<td>&lt;0.1%</td>
<td>1651-29-8</td>
<td>QH4377000</td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td>DMSO</td>
<td>&gt;99%</td>
<td>67-68-5</td>
<td>PV6210000</td>
</tr>
</tbody>
</table>

III. Hazard Identification:
This product is not for use in humans. It is intended for research purposes only.

**EMERGENCY OVERVIEW:**
Toxic. If swallowed, it can cause severe irritation of the digestive tract. Target Organs: Skin, bone marrow, lungs, gastrointestinal tract, blood. TPA is a potent tumor promoter and co-carcinogen.

IV. First Aid Measures:
Inhalation: If inhaled, remove to fresh air. If breathing is difficult, get medical attention.
Ingestion: If swallowed, wash out mouth with water provided person is conscious. Get medical attention.
Skin exposure: In case of contact, immediately wash skin with soap and water for at least 15 minutes. Remove contaminated clothing. Wash clothing before reuse.
Eye exposure: In case of contact with eyes, immediately flush eyes with water for at least 15 minutes. Get medical attention.

V. Fire Fighting Measures: (based on predominant ingredient: Dimethyl sulfoxide CAS# 67-68-5)
**Flash Point:** 186.6°F, 87°C Method: closed cup
**Autoignition Temperature:** 301°C
**Explosion:** Lower limit: 3.5%, Upper limit: 42%
**Fire extinguishing media:** Water spray, dry chemical, alcohol foam, or carbon dioxide
**Firefighting:** Wear protective clothing and self-contained breathing apparatus to prevent contact with skin and eyes.
**Specific Hazard:** Combustible Liquid. Emits toxic fumes under fire conditions.

VI. Accidental Release Measures: Small Scale Spills
Use appropriate personal protective equipment. Sweep up material and avoid raising dust. Avoid breathing dust. Transfer to a closed chemical waste container for disposal. Wash spill site after material has been picked up for disposal.

VII. Handling And Storage:
Store in tightly closed container at 4°C. Keep away from heat and open flame. Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Avoid contact with DMSO solutions containing toxic materials or materials containing unknown toxicological properties. DMSO is readily absorbed through skin and may carry materials into the body. Avoid repeated or prolonged exposure.

VIII. Exposure Controls/Personal:
**Ventilation System:** A system of local and/or general exhaust is recommended.
**Skin Protection:** Wear compatible chemical resistant gloves and protective clothing.
**Eye protection:** Wear protective safety glasses or chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

IX. Physical And Chemical Properties (based on predominant ingredient: Dimethyl sulfoxide CAS# 67-68-5)
**Appearance:** Clear, colorless liquid
**pH:** Data not available
**Melting Point:** 18.4°C
**Boiling Point:** 189°C
**Freezing Point:** Data not available
**Volatile Organic Compounds:** Data not available
**Flash point:** 87°C (188.6°F)
**Flammability:** Data not available
**Autoignition temp:** 301°C
**Solubility:** Miscible in water; soluble in alcohols, ethyl ethers

X. Stability and Reactivity:
**Stability:** Stable under normal conditions.
**Conditions/materials to avoid:** Exposure to moisture, acid chlorides, phosphorus halides, strong acids, strong oxidizing agents, strong reducing agents.
**Hazardous Decomposition:** Carbon oxides, sulfur oxides.
**Hazardous Exothermic Reactions:** DMSO undergoes a violent exothermic reaction on mixing with copper wool and trichloroacetic acid. On mixing with potassium permanganate it will flash instantaneously. It reacts violently with: acid halides, cyanuric chloride, silicon tetrafluoride, phosphoryl trichloride and trioxide, thiol chloride, magnesium perchlorate, silver fluoride, methyl bromide, iodine pentafluoride, nitrogen peroxide, dializar, sodium hydride, and perchoric and periodic acids. When heated above its boiling point, methyl sulfoxide degrades giving off formaldehyde, methyl mercaptan, and sulfur dioxide.
**Hazardous polymerization:** Will not occur.

XI. Toxicological Information:
**Acute Toxicity:** Data not available.
TPA: Potent tumor promotor. Co-carcinogens activity. RTECS#: QH4377000
DMSO: Readily absorbed through skin. RTECS#: PV6210000
**Signs and Symptoms of Exposure:** To the best of our knowledge, the chemical, physical, toxicological properties of this product have not been thoroughly investigated.
**Potential Health Effects:**
Inhalation: May be harmful if inhaled. Causes respiratory tract irritation.
Skin: May be harmful if absorbed through skin. May cause skin irritation.
Eyes: May cause eye irritation.
**Ingestion:** May be harmful if swallowed.
**Target Organs:** Skin, Bone marrow, lungs, gastrointestinal tract, blood.

XII. Ecological Information:
(For Predominant Ingredient, DMSO, CAS# 67-68-5)
**Toxicity to Fish:** LC50: Pimephales promelas (fathead minnow): 34,000 mg/L. 96h.
LC50: Oncorhynchus mykiss (rainbow trout): 35,000 mg/L. 96h.
**Toxicity to Daphnia and other aquatic invertebrates:** EC50: Daphnia pulex (water flea): 27,500 mg/L
**Toxicity to algae:** EC50: Lepomis macrochirus (Bluegill): >400,000 mg/L

XIII. Disposal Considerations:
Dispose of in accordance with federal, state, local environmental regulations.
XIV. Transport Information:

**DOT:**
Proper Shipping Name: Combustible Liquid, n.o.s.
UN#: NA1993
Class: CBL
Packing Group: Packing Group III
Marine Pollutant: No
Poison Inhalation Hazard: No

**IATA:**
This substance is considered Non-Hazardous for air transport.

XV. Regulatory Information:

SARA 302/313 Listed: No
SARA 311/312 Hazards: Fire Hazard, Chronic Health Hazard
OSHA Hazards: Combustible Liquid, Delayed target organ effects, Irritant
Canada (WHMIS): DSL listed:
  - Dimethyl Sulfoxide: CAS# 67-68-5
Massachusetts Right To Know: Not Listed
New Jersey Right To Know Components:
  - Dimethyl Sulfoxide: CAS# 67-68-5
  - Phorbol 12-myristate 13-acetate: CAS# 16561-29-8
Pennsylvania Right To Know Components:
  - Dimethyl Sulfoxide: CAS# 67-68-5
  - Phorbol 12-myristate 13-acetate: CAS# 16561-29-8
California Prop 65: This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.

XVI. Other Information:

This compound is sold only for research use only. It is not for use in humans. To the best of our knowledge, this document is accurate. It is intended to serve as a guide for safe use of this product in a laboratory setting by experienced personnel. The burden of safe use of this material rests entirely with the user. Cell Signaling Technology, Inc., shall not be held liable for any damage resulting from the handling of or from contact with the above product.