1. IDENTIFICATION

Product name: Retinoic Acid
Product code: R0064
Product use: For laboratory research purposes.
Restrictions on use: Not for drug or household use.

Company: TCI America
9211 N. Harborgate Street
Portland, OR 97203 U.S.A.
Telephone: +1-800-423-8616 / +1-503-283-1681
Fax: +1-888-520-1075 / +1-503-283-1987
e-mail: sales-US@TCIchemicals.com
www.TCIchemicals.com

Emergency telephone number:
Chemical Emergencies: TCI America (8:00am - 5:00pm) PST
+1-503-286-7624
Transportation Emergencies: Chemtrec 24-Hour
+1-800-424-9300 (U.S.A.)
+1-703-527-3887 (International)
Responsible department: TCI America
Environmental Health Safety and Security
+1- 503-286-7624

2. HAZARD(S) IDENTIFICATION

OSHA Haz Com: CFR 1910.1200:
Acute Toxicity - Oral [Category 4]
Skin Corrosion/Irritation [Category 2]
Eye Damage/Irritation [Category 2A]

WHMIS 2015:

Signal word: Warning!

Hazard Statement(s):
Harmful if swallowed
Causes skin irritation
Causes serious eye irritation

Pictogram(s) or Symbol(s):

Precautionary Statement(s):

[Prevention]
Do not eat, drink or smoke when using this product. Wash hands and face thoroughly after handling.
Wear protective gloves, eye protection.

[Response]
If swallowed: Call a poison center or doctor if you feel unwell. Rinse mouth. If on skin: Wash with plenty
of soap and water. If skin irritation occurs: Get medical advice or attention. Take off contaminated
clothing and wash it before reuse. If in eyes: Rinse cautiously with water for several minutes. Remove
contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice
or attention.

[Disposal]
Dispose of contents and container in accordance with local, regional, national regulations (e.g. US: 40

Hazards not otherwise classified:
[HNOC]
None.
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substance/mixture:</th>
<th>Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Components:</td>
<td>Retinoic Acid</td>
</tr>
<tr>
<td>Percent:</td>
<td>&gt;93.0%(HPLC)</td>
</tr>
<tr>
<td>CAS RN:</td>
<td>302-79-4</td>
</tr>
<tr>
<td>Molecular Weight:</td>
<td>300.44</td>
</tr>
<tr>
<td>Chemical Formula:</td>
<td>C20H28O2</td>
</tr>
<tr>
<td>Synonyms:</td>
<td>all-trans-3,7-Dimethyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraenoic Acid, all-trans-Retinoic Acid, ATRA, Tretinoin, Vitamin A Acid</td>
</tr>
</tbody>
</table>

4. FIRST-AID MEASURES

<table>
<thead>
<tr>
<th>Description of first aid measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation:</td>
</tr>
<tr>
<td>Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention if you feel unwell.</td>
</tr>
<tr>
<td>Skin contact:</td>
</tr>
<tr>
<td>Remove/Take off immediately all contaminated clothing. Gently wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention.</td>
</tr>
<tr>
<td>Eye contact:</td>
</tr>
<tr>
<td>Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.</td>
</tr>
<tr>
<td>Ingestion:</td>
</tr>
<tr>
<td>Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symptoms/effects:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute:</td>
</tr>
<tr>
<td>Delayed:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indication of any immediate medical attention:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Notes to physician:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No data available</td>
</tr>
</tbody>
</table>

5. FIRE-FIGHTING MEASURES

<table>
<thead>
<tr>
<th>Suitable extinguishing media:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry chemical, foam, water spray, carbon dioxide.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazardous combustion products:</th>
</tr>
</thead>
<tbody>
<tr>
<td>These products include: Carbon oxides</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other specific hazards:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed containers may explode from heat of a fire.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Advice for firefighters:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear self-contained breathing apparatus if possible.</td>
</tr>
</tbody>
</table>

6. ACCIDENTAL RELEASE MEASURES

<table>
<thead>
<tr>
<th>Personal precautions, protective equipment and emergency procedures:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use personal protective equipment. Keep people away from and upwind of spill/leak. Entry to non-involved personnel should be controlled around the leakage area by roping off, etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Methods and materials for containment and cleaning up:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevent product from entering drains. Sweep dust to collect it into an airtight container, taking care not to disperse it. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.</td>
</tr>
</tbody>
</table>

7. HANDLING AND STORAGE

<table>
<thead>
<tr>
<th>Precautions for safe handling:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handling is performed in a well ventilated place. Wear suitable protective equipment. Prevent dispersion of dust. Wash hands and face thoroughly after handling. Use a local exhaust if dust or aerosol will be generated. Avoid contact with skin, eyes and clothing.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conditions for safe storage, including any incompatibilities:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage conditions:</td>
</tr>
<tr>
<td>Keep container tightly closed. Store in a cool and dark place. Store under inert gas. Store away from incompatible materials such as oxidizing agents. Light-sensitive Air-sensitive</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Packaging material:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comply with laws.</td>
</tr>
</tbody>
</table>
8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Appropriate engineering controls: Follow safe industrial engineering/laboratory practices when handling any chemical. Install a closed system or local exhaust as possible so that workers should not be exposed directly. Also install safety shower and eye bath.

Personal protective equipment
Respiratory protection: Dust respirator. Follow local and national regulations.
Hand protection: Protective gloves.
Eye protection: Safety glasses. A face-shield, if the situation requires.
Skin and body protection: Protective clothing. Protective boots, if the situation requires.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state (20°C): Solid
Form: Crystal - Powder
Colour: Pale yellow - Deep yellow
Odour: No data available
Odor threshold: No data available
Odor threshold: No data available
Melting point/freezing point: 180°C (356°F)
Boiling point/range: No data available
Decomposition temperature: No data available
Relative density: No data available
Kinematic viscosity: No data available
Log Pow: No data available
Evaporation rate (Butyl Acetate=1): No data available
Flash point: No data available
Flammability (solid, gas): No data available
Autoignition temperature: No data available
Flammability or explosive limits: No data available
Lower: No data available
Upper: No data available
Solubility (ies): Insoluble
[Water]
[Other solvents]
Soluble: Ether, Dimethyl sulfoxide (DMSO)
Slightly soluble: Alcohols
Insoluble: Glycerol

10. STABILITY AND REACTIVITY

Reactivity: No data available
Chemical stability: Stable under proper conditions.
Possibility of hazardous reactions: No special reactivity has been reported.
Incompatible materials: Oxidizing agents
Hazardous decomposition products: Carbon dioxide, Carbon monoxide
11. TOXICOLOGICAL INFORMATION

RTECS Number: VH6475000

Acute Toxicity:
ip-rat LD50: 96 mg/kg
ivr-rat LD50: 75 mg/kg
orl-rat LD50: 2 g/kg
sco-rat LD50: 53 mg/kg

Skin corrosion/irritation:
skn-hmn 525 mg/21D-I MLD
schn-hmn 0.05 %/24H MLD

Serious eye damage/irritation:
No data available

Respiratory or skin sensitization:
No data available

Germ cell mutagenicity:
dni-hmn-leu 1 umol/L
oms-hmn-skn 1000 ppm

Carcinogenicity:
No data available

IARC: No data available NTP: No data available OSHA: No data available

Reproductive toxicity:
skn-rat TDLo: 27 500 ug/kg (6-16D preg)
orl-rat TDLo: 1.25 mg/kg (14D preg)

Target organ(s): No data available

12. ECOLOGICAL INFORMATION

Ecotoxicity:
Fish: No data available
Crustacea: No data available
Algae: No data available

Persistence / degradation: No data available
Bioaccumulative potential(BCF): No data available
Mobility in soil
Log Pow: No data available
Soil adsorption (Koc): No data available
Henry’s Law (PaM³/mol): No data available

13. DISPOSAL CONSIDERATIONS

Disposal of product: Recycle to process if possible. It is the generator’s responsibility to comply with Federal, State and Local rules and regulations. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. This section is intended to provide assistance but does not replace these laws, nor does compliance in accordance with this section ensure regulatory compliance according to the law. US EPA guidelines for Identification and Listing of Hazardous Waste are listed in 40 CFR Parts 261. The product should not be allowed to enter the environment, drains, water ways, or the soil.

Disposal of container: Dispose of as unused product. Do not reuse empty containers.

Other considerations: Observe all federal, state and local regulations when disposing of the substance.

14. TRANSPORT INFORMATION

DOT (US) Non-hazardous for transportation.
IATA Non-hazardous for transportation.
IMDG Non-hazardous for transportation.
15. REGULATORY INFORMATION

Toxic Substance Control Act (TSCA 8b.):
This product is ON the EPA Toxic Substances Control Act (TSCA) inventory.

US Federal Regulations
CERCLA Hazardous substance and Reportable Quantity:
- SARA 313: Not Listed
- SARA 302: Not Listed

State Regulations
State Right-to-Know
- Massachusetts: Not Listed
- New Jersey: Not Listed
- Pennsylvania: Not Listed

California Proposition 65: Listed

Other Information

International Inventories
- Canada: DSL On DSL
- EC-No: 206-129-0

16. OTHER INFORMATION

Revision date: 07/06/2018
Revision number: 1

TCI chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its affiliates or subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our SDS are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated SDS for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, face mask, fume hood). For proper handling and disposal, always comply with federal, state and local regulations.