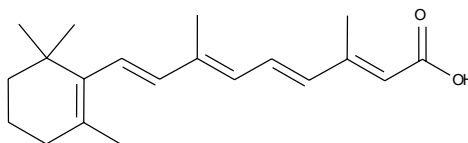


1. Product and Company Identification

Product name	Tretinoin	
Product code	04 1809 9	
Company information	Enquiries: Hoffmann-La Roche Inc. 340 Kingsland Street USA-Nutley, N.J. 07110-1199 United States of America	Local representation:
	Phone 001-973/235 50 00	
	US Emergency phone: (800)-827-6243 US Chemtrec phone: (800)-424-9300	
Roche number	Ro 01-5488/000	
CAS number	302-79-4	
Synonyms	<ul style="list-style-type: none"> - Retinoic acid - VESANOID (R) Substance - all trans-retinoic acid - Vitamin A acid - 13-trans-retinoic acid 	
Characterization	pharmaceutical active substance in the class of retinoids	

2. Composition/Information on ingredients

Chemical name	- (all-E)-3,7-Dimethyl-9-(2,6,6-trimethyl-1-cyclohexene-1-yl)-2,4,6,8-nonatetraenoic acid
Percentage	≥ 99 %



Tretinoin

3. Hazards identification

Emergency Overview

Form	crystalline powder
Color	yellow to light orange
Odor	almost odourless

Hazard Overview	<ul style="list-style-type: none">- May cause birth defects based on animal data.- Violent decomposition may occur when heated or in fire based on information on related materials- Possible dust explosion hazard based on information on related materials
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Potential Health Effects	<ul style="list-style-type: none">- Exposure: Inhalation, Ingestion, Skin contact, Eye contact- Target Organs: skin, liver, gastrointestinal system, Central nervous system, Immune System - Acute Effects: May cause skin irritation., May cause drying and/or irritation of the mucous membrane., May cause central nervous system effects., Signs and symptoms may include headache, dizziness, drowsiness, fatigue and lack of muscular coordination., May cause headache., May cause hepatic (liver) system effects., Signs and symptoms may include elevation of liver enzyme levels and jaundice (yellowing of the skin and eyes)., May cause gastrointestinal effects., Signs and symptoms may include nausea, vomiting, diarrhea, constipation, cramps, and loss of appetite., May cause musculoskeletal effects., Signs and symptoms may include muscle weakness or pain and skeletal abnormalities. - Chronic Effects: No adverse effects known - Carcinogenicity: not listed by NTP, IARC or OSHA
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Additional Health Information	<ul style="list-style-type: none">- Reproductive Toxicity: May cause birth defects based on animal data.- Since this material may affect the developing fetus, females planning to have a child and pregnant women should exercise caution regarding exposure.- It is also advisable for nursing mothers to exercise caution regarding exposure.- Conditions Aggravated: Liver conditions and/or impaired liver function.
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Note	<ul style="list-style-type: none">- women of childbearing potential must not be engaged in any work where dust exposure might occur. In case of doubt a risk assessment is advised.
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Tretinoin

4. First-aid measures

Eye contact	<ul style="list-style-type: none">- rinse immediately with tap water for 10 minutes - open eyelids forcibly- consult physician
Skin contact	<ul style="list-style-type: none">- remove immediately contaminated clothes, wash affected skin with water and soap - do not use any solvents- consult physician
Inhalation	<ul style="list-style-type: none">- remove the casualty to fresh air and keep him/her calm- get medical treatment
Note to physician	<ul style="list-style-type: none">- after accidental exposure women should get medical advice from a physician

5. Fire-fighting measures

Suitable extinguishing media	<ul style="list-style-type: none">- water spray jet, dry powder, foam, carbon dioxide
Flash point (liquid)	not applicable
Specific hazards	<ul style="list-style-type: none">- consider dust explosion hazard- substance is hazardous for water: contain fire-fighting wastewater
Protection of fire-fighters	<ul style="list-style-type: none">- precipitate gases/vapours/mists with water spray

6. Accidental release measures

Environmental protection	<ul style="list-style-type: none">- do not allow to enter drains or waterways
Methods for cleaning up	<ul style="list-style-type: none">- collect solids (avoid dust formation) and hand over to waste removal- clean contaminated areas with little ethanol

7. Handling and storage

Handling

Technical measures	<ul style="list-style-type: none">- processing in closed systems, superposed by inert gas (e.g. nitrogen)- local exhaust ventilation necessary- take precautionary measures against electrostatic charging- avoid dust formation; very high dust explosion hazard
Suitable materials	<ul style="list-style-type: none">- glass, plastic
Note	<ul style="list-style-type: none">- metal containers have to be coated with a non-metallic cover

Tretinoin

Storage

Storage conditions	<ul style="list-style-type: none">- < 8 °C- for quality reasons protected from humidity- under argon- protected from light
Validity	<ul style="list-style-type: none">- 48 months, 2 to 8 °C, under argon, in the unopened original container, after opening the container, the contents should be used within a short period, see "best use before" date stated on the label
Packaging materials	<ul style="list-style-type: none">- tightly closing; material: dark glass, plastic

8. Exposure controls/Personal protection

Engineering Measures	<ul style="list-style-type: none">- see 7.
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Monitoring

Threshold value (Roche) air	<ul style="list-style-type: none">- IOEL (Internal Occupational Exposure Limit): 0.02 mg/m³ (men)- IOEL (Internal Occupational Exposure Limit): 0.001 mg/m³ (women of childbearing age)
Analytics	<ul style="list-style-type: none">- sampling on glass fibre filter and gravimetric or chemical determination

Personal protective equipment

Respiratory protection	<ul style="list-style-type: none">- Respiratory protection is recommended as a precaution to minimize exposure. Effective engineering controls are considered to be the primary means to control worker exposure. Respiratory protection should not substitute for feasible engineering controls.- in case of open handling or accidental release: particle mask or respirator with independent air supply
Hand protection	<ul style="list-style-type: none">- protective gloves (eg made of neoprene, nitrile or butyl rubber)
Eye protection	<ul style="list-style-type: none">- safety glasses
Body protection	<ul style="list-style-type: none">- protective clothing
General protective and hygiene measures	<ul style="list-style-type: none">- instruction of employees mandatory

9. Physical and chemical properties

Color	yellow to light orange
Form	crystalline powder
Odor	almost odourless
Molecular mass	300.4 g/mol

Tretinoin

Empirical formula	$C_{20}H_{28}O_2$
Solubility	insoluble, water (20 °C) soluble, chloroform slightly soluble, ethanol
Melting temperature	180 to 184 °C
10. Stability and reactivity	
Conditions to avoid	- warming - light - humidity
Materials to avoid	- atmospheric oxygen, oxidizing agents, metals, water
11. Toxicological information	
Acute toxicity	- LD ₅₀ 2'000 mg/kg (oral, rat) - LD ₅₀ 2'200 mg/kg (oral, mouse)
Local effects	- eye: irritant - mucous membranes: irritant - irritation of skin (slight keratosis, desquamation and inflammation by 0.1% solution) - strong skin irritation, may be increased by UV light
Subchronic toxicity	- hypervitaminosis A symptoms: reduced body weight, reddening and desquamation of skin, alteration of mucous membranes of nose and mouth
Mutagenicity	- not mutagenic (Ames test)
Reproduction toxicity	- teratogenic (man); teratogenic in experimental animals at doses > 0.5 mg/kg/day (oral, s.c., rabbit) - teratogenic and embryotoxic *1
Note	- maximum non-teratogenic dose for humans substantially lower than for experimental animals - women of childbearing potential must not be engaged in work where dust exposure may occur; in case of doubt a risk assessment is advised
*1 referring to:	Vitamin A

Tretinoin

12. Ecological information

Inherent biodegradability	- inherently biodegradable 54 %, 28 d (MITI Test II, OECD No. 302 C)
Ecotoxicity	- strongly toxic for planktonic crustaceans (Daphnia magna) EC ₅₀ (48 h) 3.1 mg/l NOEC (48 h) 1.8 mg/l (OECD No. 202) - barely toxic for algae (nominal concentration > 100 mg/l) (Selenastrum capricornutum) NOEbC (72 h) 80 mg/l NOErC (72 h) 80 mg/l (OECD No. 201) - barely toxic for microorganisms (activated sludge) NOEC (28 d) 30 mg/l
Air pollution	- observe local/national regulations

13. Disposal considerations

Waste from residues	- incinerate in qualified installation with flue gas scrubbing - observe local/national regulations regarding waste disposal
RCRA waste	- not regulated under RCRA

14. Transport information

IATA	Class	UN/ID	PG		PI	Label	
	9	3077	III		911/911	9	
IMDG	Class	UN	PG	EmS	PI	Label	Mark
	9	3077	III	F-A S-F	P002/IBC08	9	
RID/ADR	Class	UN	PG	Haz.no	PI	Label	Classif.code
	9	3077	III	90	P002/IBC08	9	M7
DOT	Class	UN/ID	PG	PI	RQ	Label	Haz.no
	9	3077	III			9	
DOT Remark:				- NON-REGULATED IN NON-BULK PACKAGINGS TRANSPORTED BY MOTOR VEHICLES, RAIL CARS OR AIRCRAFT (49CFR 171.4(c)).			

Tretinoin

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
Technical name	Tretinoin

15. Regulatory information

US Regulations	<ul style="list-style-type: none">- Regulated: Tretinoin- Law: hazardous chemical reporting: community right-to know- Ident_No: 40CFR370- Common name: SARA title 312- Agency: Environmental Protection Agency EPA- Authority: USA- Criteria met: acute, fire- Regulated: Tretinoin- Law: safe drinking water and toxic enforcement act of 1986- Ident_No: Proposition 65- Common name: Prop 65- Agency: California Environmental Protection Agency- Authority: California- Criteria met: known to the state to cause reproductive toxicity
TSCA Status	<ul style="list-style-type: none">- On TSCA inventory
Reporting Requirements	<ul style="list-style-type: none">- The United States Environmental Protection Agency (USEPA) has not established a Reportable Quantity (RQ) for releases of this material.- In New Jersey, report all releases which are likely to endanger the public health, harm the environment or cause a complaint to the NJDEPE Hotline (1-609-292-5560) and to local officials.- State and local regulations vary and may impose additional reporting requirements.

16. Other information

Safety-lab number	<ul style="list-style-type: none">- BS-3138- BS-7244
Note	<ul style="list-style-type: none">- the present safety data sheet also covers the unrefined product "Vitamin A acid crude", Product Code 04 1808 0, with exception of the specification for content- the present safety data sheet also covers the following products:- Tretinoin, Product Code 04 4049 3
Edition documentation	<ul style="list-style-type: none">- changes from previous version in sections 7

The information in this safety data sheet is based on current scientific knowledge. It should not be taken as expressing or implying any warranty concerning product characteristics.