SAFETY DATA SHEET

1. Chemical product and company identification

Product Name	**Cactus normal paraffin N-11**
Product code	CHS02
Company Name	JXTG Nippon Oil & Energy Corporation
Address	1-2, Otemachi 1-chome, Chiyoda-ku Tokyo 100-8162 Japan
Phone	+81-(0)3-6257-7360
Fax	+81-(0)3-6213-3498
Contact	Solvent,Normal Paraffin &LAB Group, Aromatics Dept., CHEMICAL DIVISION

2. Hazards identification

GHS Classification

Physical hazards	Flammable liquids	Category 4
Health Hazards	Specific target organ toxicity - single exposure	Category 3 (Respiratory tract irritation)
	Aspiration hazard	Category 1
Environmental Hazards	Acute aquatic hazard	Category 1
	Long-term aquatic hazard	Category 1

GHS-labeling

Signal word

Danger

Hazard statement

Combustible liquid
May cause respiratory irritation
May be fatal if swallowed and enters airways.
Very toxic to aquatic life
Very toxic to aquatic life with long lasting effects.

Prevention

Keep away from heat/sparks/open flames/hot surfaces – No smoking.
Keep container tightly closed.
Avoid breathing mist/vapours.
Use only outdoors or in a well-ventilated area.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

Response

In case of fire: Use foam, dry chemical or carbon dioxide(CO2) for extinction.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Call a POISON CENTER or doctor/physician if you feel unwell.
Do NOT induce vomiting.
Collect spillage.

Storage

Store in well-ventilated place. Keep container tightly closed.
Store in well-ventilated place. Keep cool.
Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

3. Composition/information on ingredients

Substance

Components	CAS #	Content
n-Undecane	1120-21-4	≧ 98%

4. First aid measures

First aid procedures	Keep warm by blanket and keep at rest after first aid. Get medical attention promptly.
Inhalation	Move injured person into fresh air and keep person calm under observation. Get medical attention if any discomfort continues.
Skin contact	Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms occur after washing. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital.
Eye contact	Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyelids wide apart. Get medical attention if irritation develops and persists .
Ingestion	Rinse mouth thoroughly. Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs. Get medical attention immediately.
Expected acute symptoms and delayed symptoms	Repeated exposure may cause skin dryness or cracking
Personal protection for first-aid responders	First aid personnel must be aware of own risk during rescue
Notes to physician	Be aware that symptoms of chemical pneumonia (shortness of breath) may occur several hours after exposure.

5. Fire-fighting measures

Extinguishing media	Extinguish with foam, carbon dioxide, or dry powder.
Extinguishing media to avoid	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards	The product is flammable, and heating may generate vapors which may form explosive vapor/air mixtures. During fire, gases hazardous to health may be formed.
Specific firefighting method	Move containers from fire area if you can do it without risk. Use water spray to cool unopened containers. Cool containers exposed to flames with water until well after the fire is out
Protection of fire-fighting Personnel	Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

6. Accidental release measures

Personal safety precautions	Stay upwind. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Avoid inhalation of vapors/spray and contact with skin and eyes. Wear appropriate personal protective equipment. For personal protection, see section 8 of the MSDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground. Contact local authorities in case of spillage to drain/aquatic environment.
Recovery, neutralization	Remove sources of ignition. Stop the flow of material, if this is without risk. Absorb spillage with non-combustible, absorbent material.
Clean-up methods and materials and containment measures	Stop leakage if safe to do so. Ground/bond all equipment used to handle the leaked substance. Vapor suppression foam is used to reduce the vapor concentration. Use clean antistatic equipment when gathering absorbed material.
Prevention of secondary hazards	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

7. Handling and storage

Handling

Engineering measures	Use non-sparking tools and explosion-proof equipment. Provide adequate general and local exhaust ventilation.
Safety handling precautions	Avoid inhalation of vapors and spray mist and contact with skin and eyes. Avoid heat, sparks, open flames and other ignition sources. The product is flammable, and heating may generate vapors which may form explosive vapor/air mixtures. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
Contact avoidance	Oxidant

Storage

Engineering measures	Provide adequate ventilation.
Storage conditions	Keep away from heat, sparks and open flame. Keep containers tightly closed in a cool, well-ventilated place. Ground container and transfer equipment to eliminate static electric sparks..
Incompatible material	Oxidizing agent. Strong bases. Reducing agents
Container/packaging materials	Use containers designated by the applicable law and the U.N. transportation regulations.

8. Exposure controls/personal protection

Occupational exposure limits	No exposure limits noted for ingredient(s).
Engineering measures	Provide adequate ventilation and minimize the risk of inhalation of vapors and mists. Use explosion-proof equipment.

Protective equipment

Respiratory protection	In case of inadequate ventilation, use suitable respiratory equipment with gas filter for organic gas.
Hand protection	Wear protective gloves. Chemical/oil resistant gloves are recommended. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.
Eye protection	Wear approved safety goggles.
Skin and body protection	Wear special protective clothing. Chemical/oil resistant clothing is recommended.
Hygienic measures	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	Colorless liquid.
Physical state	Liquid.
Form	Liquid.
Odor	Slight paraffinic.
Odor threshold	Not available.
Melting point/ Freezing point	- 25℃
pH	Not available.
Boiling point	190 - 194 ℃
Flammability limits in air, lower, % by volume	0.7 %
Flammability limits in air, upper, % by volume	5.5 %
Flash point	≧63 ℃
Autoignition temperature	214 ℃
Density	0.744g/cm3 (15℃)
Solubility	Water 0.05(mg/L) (27℃)
n-octanol/water partition coefficient	5.74
Viscosity	1.098 mPa s (25℃)

Vapor pressure	54.9 Pa (25°C)
Vapor density	5.4 (Air=1)

10. Stability and reactivity

Stability	Stable under normal handling condition.
Possibility of hazardous reactions	Keep away from any possible contact with strong oxidizing agents.
Conditions to avoid	Contact with incompatible hazard substances Prolonged heating, open flames, and ignition sources
Contact avoidance	Use care to keep away from any possible contact with halogens, strong acids, alkalis, and acidifying substances.
Hazardous decomposition products	When burnt, may release carbon monoxide and other gases.

11. Toxicological information

Acute toxicity	Oral, rat	LD_{50} >2,000 mg/kg
	Inhalation	LD_{50} >625ppm (Rat)
	Dermal	No sufficient information
Skin corrosion / irritation	In the human case of occupational exposure to undecane, skin irritation was reported (PATTY, 5th (2001)). On the other hands, 30% solution of the substance caused no irritation when applied to skin for 24 hours (HSDB (2010)). In the skin irritation tests in rabbits, intensity of the irritation was strongest for tetradecane, followed by heptadecane, dodecane, and undecane (HSDB (2010)). However, details on these documents were unknown, and thus, the substance was classified as "Classification not possible".	
Serious eye damage / eye irritation	In the human case of occupational exposure to undecane, eye irritation was reported (PATTY, 5th (2001)), but the classification was not possible due to insufficient data available.	
Respiratory sensitization	No data available.	
Skin sensitization	No data available.	
Germ cell mutagenicity	The classification was not possible due to lack of in vivo test data. As relevant information, as for in vitro studies, negative results in the Ames test and in the chromosome aberration test using CHL/IU cells were reported ("Toxicity Testing Reports of Environmental Chemicals" (Chemicals Investigation Promoting Council), (Access on Aug. 2010)).	
Carcinogenicity	No data available. Suspected of causing cancer (Category 2)	
Reproductive toxicity	In the combined repeated oral dose toxicity study with the reproduction/developmental toxicity screening test in rats (OECD TG 422, GLP-compliant), the highest dose induced general toxicity of parental animals such as salivation and suppression of body weight gain. However, there was no influence in the examinations for reproductive performance, delivery or maternal behavior of dams, and no effects were noted in viability, general condition or findings in autopsy of offspring ("Toxicity Testing Reports of Environmental Chemicals" (Chemicals Investigation Promoting Council), (Access on Aug. 2010)). However, since there was no information about developmental effects on offspring, the classification was not possible.	
Specific target organ toxicity (Single exposure)	In the acute oral toxicity study in rats (OECD TG 401, GLP-compliant), no deaths occurred and no test substance (undecane) related effects on clinical signs, body weight change, macroscopic or microscopic examinations were observed in both sexes at the dose of 2000 mg/kg ("Toxicity Testing Reports of Environmental Chemicals" (Chemicals Investigation Promoting Council) (Access on Aug. 2010)). From the information, the classification corresponded to "Not classified" category for oral route. However, since the substance was reported to be irritating to the mucous membranes and the upper respiratory tract (PATTY, 5th (2001)), the substance was classified as Category 3 (respiratory tract irritation).	
Specific target organ toxicity	In the combined repeated dose oral toxicity study with the reproduction	

(Repeated exposure)	/developmental toxicity screening test in rats (OECD TG 422, GLP-compliant), salivation was observed in groups at 300 mg/kg/day or higher, and the changes of some parameters in hematology and clinical chemistry and increase in the liver weight were observed in the group at 1000 mg/kg/day. No effects by treatment with the test substance (undecane) were detected in both macroscopic and microscopic examinations ("Toxicity Testing Reports of Environmental Chemicals" (Chemicals Investigation Promoting Council) (Access on Aug. 2010)). Therefore, based on no serious toxic effects at 300 mg/kg (converted dose level as that of 90-day study: approx. 150 mg/kg/day; over the upper limit of the guidance values (100 mg/kg)), classification was equivalent to "Not classified" category for oral route.
Aspiration hazard	This substance was classified as Category 1 because it was a hydrocarbon having the coefficient of kinematic viscosity of < 7 mm2/s at 40 degrees centigrade (GESTIS (Access on Aug. 2010)), namely, 20.5 mm2/s or less. As relevant information, it was reported in the human case that direct aspiration into the lungs of paraffin's with carbon numbers C6 to C16 may cause chemical pneumonitis, pulmonary edema and hemorrhaging (HSDB (2003))

12. Ecological information [d)]

Ecotoxicity

Acute aquatic toxicity	Classified into Category 1 from its 48h-EC50 = 0.011 mg/L for crustacea (Daphnia magna) (Test for the Ecological Effect of Chemical Substances (Ministry of the Environment), 2004).
Chronic aquatic toxicity	Classified into Category 1 since its acute toxicity is Category 1 and it is suspected that its bioaccumulation potential is high from LogPow = 6.5 (PHYSPROP Database, 2011).
Persistence and degradability	No data available
Bioaccumulation	See Section 9 for log Kow
Mobility in soil	No data available
Other hazardous effect	No data available

13. Disposal considerations

Residual contents	Dispose of in accordance with local regulations.
Contaminated containers and packaging	Since emptied containers retain product residue, follow label warnings even after container is empty.

14. Transport information

International regulations

Marine regulation	Follow the IMO regulations.
UN No.	3082
Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
UN classification	Class 9
Air regulation	Follow the ICAO/IATA regulations.

15. Regulatory information

National laws and regulations

Comply with applicable laws and regulations.

16. Other information

References

Model SDS, Japan Advanced Information center of Safety and Health
Data base of GHS classification, National Institute of Technology and Evaluation (NITE)
(http://www.safe.nite.go.jp/ghs/ghsi.html)