SECTION 1 IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

1.1 Product identifiers

Product Form	Mixture
Trade Name	Titanium Dioxide (TiO2) Dispersion in PGMEA, Size: 1 µm, Rutile, 20 wt%
Product Number	NG02MD01040
CAS Number	Rutile TiO2 CAS#: 1317-80-2 PGMEA CAS#: 108-65-6

1.2 Relevant identified uses of the substance or mixture and uses adviced against

Use of the substance/mixture	Research

1.3 Details of the supplier of safety data sheet

Company	Nanografi Nanotechnology
Address	ODTÜ Teknokent İkizler Binası B-1/H ODTÜ Teknokent 06531- ANKARA
Phone	+90 312 285 85 09
Fax	+90 312 210 13 09

1.4 Emergency Telephone Number

Emergency Telephone Number	+90 312 285 85 09

SECTION 2 HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to 29 CFR 1910 (OSHA HCS)

H226	Flam. Liquid 3
H336	STOT – SE 3 (Oral)

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label Elements

Hazard Pictograms	
Signal Word	Warning
Hazard Statements	H226 Flammable liquid and vapor. H336 May cause drowsiness or dizziness.
Precautionary Statements	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. – No smoking. P233 Keep container tightly closed. P240 Ground/bond container and receiving equipment. P241 Use explosion proof electrical/ ventilating/ lighting equipment. P264 Wash skin thoroughly after handling. P312 Call a POISON CENTER or doctor/ physician if you feel unwell. P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish. P403 + P235 Store in a well-ventilated place. Keep cool. P405 Store locked up. P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Other Hazards

None.

SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Not applicable.

3.2 Mixtures

Product	Synonyms	CAS Number	Classification
Rutile TiO_2	Titanium Dioxide (Rutile)	1317-80-2	Not a hazardous substance.
PGMEA	Propylene glycol monomethyl ether acetate	108-65-6	Flam Liq. 3; H226. STOT SE 3; H336

SECTION 4 FIRST AID MEASURES

4.1 Description of first aid measures

First-aid measures after inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. Consult a physician.
First-aid measures after skin contact	Wash with plenty of soap and water. Consult a physician if irritation develops and persists.
First-aid measures after eye contact	Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation persists.
First-aid measures after ingestion	Never give anything by mouth to an unconscious person. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention.

4.2 Most important symptoms and effects, including acute and delayed

Most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11.

4.3 Indication of any immediate medical attention and special treatment needed

No data available.

SECTION 5 FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable Extinguishing Media	Dry chemical, alcohol-resistant foam, Sand
Unsuitable Extinguishing Media	Water Jet

5.2 Special hazards arising from the substance or mixture

Hazardous Decomposition Products	Carbon Oxides, Titanium Oxides. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur.

5.3 Advice for firefighters

In case of fire wear self-contained breathing apparatus and full protective gear.

SECTION 6 ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Protective Equipment	Wear suitable protective clothing.
Emergency Procedures	Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2.2 For emergency responders

Protective Equipment	Wear suitable protective clothing, gloves and eye/face protection.
Emergency Procedures	Provide adequate ventilation. Evacuate area. Avoid generation of dust.

6.2 Environmental precautions

Do not allow to enter into surface water or drains.

6.3 Methods and material for containment and cleaning up

Methods and material for containment and cleaning up	Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite). Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For further information refer to section 13.

SECTION 7 HANDLING AND STORAGE

7.1 Precautions for safe handling

Precautions for Safe Handling	Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition - No smoking. For precautions see section 2.2.
Hygiene measures	Do not eat, drink or smoke when using this product.

7.2 Conditions for safe storage, including any incompatibilities

Storage Conditions	Store in dry, cool, well-ventilated area. Keep container tightly closed. Keep away from heat, sparks, and flame. Keep away from sources of ignition. Do not store in direct sunlight. Flammables-area.
Technical Measures	Store in the following material(s): Carbon steel. Stainless steel. Phenolic lined steel drums. Do not store in: Aluminum. Copper. Galvanized iron. Galvanized steel.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

No data available.

8.2 Exposure controls

Appropriate Engineering Controls	Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
Hand Protection	Use antistatic gloves. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.
Eye Protection	Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Skin and Body Protection	Impervious clothing. Flame retardant antistatic protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory Protection	NIOSH N-100 or P-100 rated particulate respirator with full face mask.
Environmental Exposure Controls	Avoid release to the environment. Do not let product enter drains.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical State	Liquid
Odor	No data available
Odor Threshold	No data available
pH	No data available
Relative Evaporation Rate	No data available
Melting Point	No data available
Freezing Point	No data available
Boiling Point	No data available
Flash Point	No data available
Auto-ignition Temperature	No data available
Decomposition Temperature	No data available
Vapor Pressure	No data available
Relative vapor density at 20°C	No data available
Specific Density	No data available
Solubility in H2O	No data available
Log Pow	No data available
Viscosity, Kinematic	No data available
Viscosity, Dynamic	No data available
Explosive Properties	No data available

9.2 Other information

No other information available.

SECTION 10 STABILITY AND REACTIVITY

10.1 Reactivity

No data available.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available.

10.4 Conditions to avoid

Heat and sources of ignition. Product can oxidize at elevated temperatures. Avoid static discharge. Flammable vapors can be released at elevated temperatures.

10.5 Incompatible materials

Strong acids, oxidizing agents. Aluminum at higher temperatures.

10.6 Hazardous decomposition products

Titanium Oxides, Carbon Oxides.

SECTION 11 TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute Toxicity	Oral: Not classified. LD50 6.190 mg/kg bw (at) (PGMEA) Inhalation: No data available. Dermal: Not classified. LD50 >2.000 mg/kg bw (rat) (PGMEA)
Skin corrosion/irritation	Not irritating
Serious eye damage/irritation	Not irritating
Respiratory or Skin Sensitization	No data available
Germ Cell Mutagenicity	No data available
Carcinogenicity	No data available
Reproductive Toxicity	No data available
STOT-Single Exposure	No data available

STOT-Repeated Exposure	No data available
Aspiration Hazard	No data available
Other Information	RTECS: AI8925000 (PGMEA) VM2940000 (TiO2) To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12 ECOLOGICAL INFORMATION

12.1 Toxicity

Ecology-general	No data available.
Acute aquatic toxicity	No data available.
Chronic aquatic toxicity	No data available.

12.2 Persistance and degradability

No data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No data available.

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6 Other adverse effects

No data available.

SECTION 13 DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product	Dispose of in accordance with local regulations.
Contaminated Packaging	Dispose of in accordance with local regulations.

SECTION 14 TRANSPORT INFORMATION

ADR	IMDG	IATA	RID
UN Number			
3271	3271	3271	3271
UN Proper Shipping Name			
ETHERS, N.O.S (TiO2 dispersion in Propylene Glycol Monomethyl Ether Acetate)	ETHERS, N.O.S (TiO2 dispersion in Propylene Glycol Monomethyl Ether Acetate)	ETHERS, N.O.S (TiO2 dispersion in Propylene Glycol Monomethyl Ether Acetate)	ETHERS, N.O.S (TiO2 dispersion in Propylene Glycol Monomethyl Ether Acetate)
Transport Document Description			
3, III	3, III	3, III	3, III

SECTION 15 REGULATORY INFORMATION

For this product a chemical safety assessment was not carried out.

SECTION 16 OTHER INFORMATION

16.1 Abbreviation of acronyms

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
IATA	International Air Transport Association

REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail

16.2 Full text of H-statements

H336	May cause drowsiness or dizziness.
H226	Flammable liquid and vapor.
STOT SE	Specific target organ toxicity - single exposure

Disclaimer

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore beconstrued as guaranteeing any specific property of the product.