

SAFETY DATA SHEET

1. Identification of the substance or mixture and of the supplier

- A. GHS product identifier Chaos[®] Crystal Golden C-601P
- B. Recommended use of the chemical and restrictions on use
Recommended use Paint and coating additives
Restrictions on use Not available
- C. Manufacturers
Company name CQV Co., Ltd.
Address 144, Seongjung-Ro, Jincheon-Eup, Jincheon-Gun, Chungbuk-Do, Korea
Emergency phone number 82-43-531-2500
Respondent Byung-Ki Choi
Fax 82-43-536-0314

2. Hazards identification

- A. GHS classification of the substance/mixture
Not classified
- B. GHS label elements, including precautionary statements
Pictogram and symbol : Not applicable
Signal word : Not applicable
Hazard statements : Not applicable
Precautionary statements
Precaution : Not applicable
Treatment : Not applicable
Storage : Not applicable
Disposal : Not applicable
- C. Other hazard information not included in hazard classification (NFPA)
Health 0
Flammability Not available
Reactivity Not available

3. Composition/information on ingredients

Chemical Name	CAS number	EC number	Content (%)
Synthetic Fluorophlogopite	12003-38-2	234-426-5	63 - 78
Tin Oxide	18282-10-5	242-159-0	0 - 1
Iron Oxide	1309-37-1	215-168-2	5 - 9
Titanium Dioxide	13463-67-7	236-675-5	17 - 27

4. First aid measures

- A. Eye contact
- In case of contact with substance, immediately flush eyes with running water at least 20 minutes.
- B. Skin contact

- In case of contact with substance, immediately flush skin with running water at least 20 minutes.
- Remove and isolate contaminated clothing and shoes.
- Wash contaminated clothing and shoes before reuse.
- Get immediate medical advice/attention.

C. Inhalation

- Specific medical treatment is urgent.
- Move victim to fresh air.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.

D. Ingestion

- Do not let him/her eat anything, if unconscious.
- Get immediate medical advice/attention.

E. Indication of immediate medical attention and notes for physician

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

5. Fire fighting measures

A. Suitable (and unsuitable) extinguishing media

- Suitable extinguishing media: Dry sand, dry chemical, alcohol-resistant foam, water spray, regular foam, CO₂
- Unsuitable extinguishing media: High pressure water streams

B. Specific hazards arising from the chemical

- If inhaled, may be harmful.

C. Special protective equipment and precautions for fire-fighters

- Dike fire-control water for later disposal; do not scatter the material.
- Move containers from fire area if you can do it without risk.
- Fire involving Tanks: Cool containers with flooding quantities of water until well after fire is out.
- Fire involving Tanks: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Fire involving Tanks: Always stay away from tanks engulfed in fire.

6. Accidental release measures

A. Personal precautions, protective equipment and emergency procedures

- Eliminate all ignition sources.
- Stop leak if you can do it without risk.
- Please note that materials and conditions to avoid.
- Ventilate the area.
- Do not touch or walk through spilled material.
- Prevent dust cloud.

B. Environmental precautions and protective procedures

- Prevent entry into waterways, sewers, basements or confined areas.

C. The methods of purification and removal

- Small Spill; Flush area with flooding quantities of water. And take up with sand or other non-combustible absorbent material and place into containers for later disposal.
- Large Spill; Dike far ahead of liquid spill for later disposal.
- With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.

7. Handling and storage

A. Precautions for safe handling

- Please note that materials and conditions to avoid.
- Wash thoroughly after handling.
- Please work with reference to engineering controls and personal protective equipment.
- Be careful to high temperature.

B. Conditions for safe storage

- Store in a closed container.
- Store in cool and dry place.

8. Exposure controls/personal protection

A. Occupational Exposure limits

Korea regulation

Titanium Dioxide TWA = 10 mg/m³

Iron Oxide TWA = 5 mg/m³

ACGIH regulation

Titanium Dioxide TWA 10 mg/m³

Iron Oxide TWA 5 mg/m³ (respirable fraction)

Biological exposure index : Not available

OSHA regulation

Titanium Dioxide TWA = 15 mg/m³

Iron Oxide TWA = 10 mg/m³

NIOSH regulation

Tin Oxide TWA = 2 mg/m³ (as Sn)

Iron Oxide TWA = 5 mg/m³

EU regulation : Not available

Other

Tin Oxide Belgium: TWA = 2 mg/m³ (as Sn) Canada: TWA = 2 mg/m³ (as Sn) Finland: TWA = 2 mg/m³ (as Sn) Spain: TWA = 2 mg/m³ (as Sn)

Titanium Dioxide Austria: TWA = 10 mg/m³ France: TWA = 10 mg/m³ (as Ti) Italy: TWA = 10 mg/m³ United Kingdom: TWA = 10 mg/m³ Russia: TWA = 10 mg/m³

Iron Oxide Canada: TWA = 5 mg/m³ (fume, as Fe) Australia: TWA = 5 mg/m³ (fume, as Fe) Finland: TWA = 5 mg/m³ (fume, as Fe) Belgium: TWA = 2 ppm (5 mg/m³) (fume, as Fe) Denmark: TWA = 3.5 mg/m³ (as Fe)

B. Appropriate engineering controls

- Provide local exhaust ventilation system or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

C. Personal protective equipment

Respiratory protection

- Wear NIOSH or European Standard EN 149 approved full or half face piece (with goggles) respiratory protective equipment when necessary.
- In case exposed to particulate material, the respiratory protective equipments as follow are recommended. ;facepiece filtering respirator or air-purifying respirator, high-efficiency particulate air(HEPA) filter media or respirator equipped with powered fan, filter media of use(dust, mist, fume)
- In lack of oxygen(< 19.5%), wear the supplied-air respirator or self-contained breathing apparatus.oxygen

Eye protection

- Wear facepiece with goggles to protect.
- An eye wash unit and safety shower station should be available nearby work place.
- Wear breathable safety goggles to protect from particulate material causing eye irritation or other disorder.
- An eye wash unit and safety shower station should be available nearby work place.

Hand protection

- Wear chemical resistant gloves.
- Wear appropriate protective gloves by considering physical and chemical properties of chemicals.

Body protection

- Wear appropriate protective chemical resistant clothing.
- Wear appropriate protective clothing by considering physical and chemical properties of chemicals.

9. Physical and chemical properties

A. Appearance

Description Powder

Color Lustrous Yellowish

B. Odor No odor

C. Odor threshold Not available

D. pH 5 – 10

E. Melting point/freezing point Not available

F. Initial boiling point and boiling range Not available

G. Flash point Not available

H. Evaporation rate Not available

I. Flammability (solid, gas) Not applicable

J. Upper/lower flammability or explosive limits Not available

K. Vapor pressure Not available

L. Solubility (ies) Not available

M. Vapor density Not available

N. Specific gravity 3.0 – 3.3 g/cm³

O. Partition coefficient: n-octanol/water Not available

P. Auto ignition temperature Not available

Q. Decomposition temperature Not available

R. Viscosity Not available

S. Molecular weight Not available

10. Stability and reactivity

A. Chemical stability and Possibility of hazardous reactions:

- If inhaled, may be harmful.

B. Conditions to avoid:

- Heat, sparks or flames

C. Incompatible materials:

- Combustibles

D. Hazardous decomposition products:

- Not available

11. Toxicological information

A. Information of Health Hazardous

Acute toxicity

Oral : Not classified

- **Synthetic Fluorophlogopite** : Rat LD₅₀ > 9,000 mg/kg
- **Tin oxide** : Rat LD₅₀ > 9,000 mg/kg
- **Titanium dioxide** : Rat LD₅₀ > 5,000 mg/kg (OECD Guideline 425, EPA OPPTS 870.1100)
- **Iron oxide** : Rat LD₅₀ > 5,000 mg/kg (EU Method B.1)

Dermal : Not available

Inhalation : Not classified

- **Synthetic Fluorophlogopite** : Rat LC₅₀ > 5 mg/L/4hr (OECD Guideline 403)
- **Tin oxide** : Rat LC₅₀ > 5 mg/L/4hr (OECD TG 403, GLP)
- **Titanium dioxide** : Rat LC₅₀ > 6.82 mg/L/4hr
- **Iron oxide** : Rat LD₅₀ = mg/L Rat = 8.5 mg/kg bw/day

Skin corrosion/ irritation : Not classified

- **Synthetic Fluorophlogopite** : The test substance was not irritating to the rabbit skin. (OECD Guideline 404)
- **Tin oxide** : Skin irritation test using rabbit, not skin irritation. (OECD TG 404)
- **Titanium dioxide** : In test on skin irritation with rabbits, skin irritations were not observed. (OECD Guideline 404)
- **Iron oxide** : As a result of skin irritation test using rabbit, skin irritation was not observed. (OECD TG 404, GLP)

Serious eye damage/ irritation : Not classified

- **Synthetic Fluorophlogopite** : The test substance was not irritating to the rabbit eyes. (OECD Guideline 405)
- **Tin oxide** : The test substance was not irritating to the rabbit eyes. (OECD TG 405)
- **Titanium dioxide** : In test on eye irritation with rabbits, eye irritations were not observed. (OECD Guideline 405, EU Method B.5, EPA OPPTS 870.2400)
- **Iron oxide** : As a result of eye irritation test using rabbit, eye irritation was not observed. (OECD TG 405, GLP)

Respiratory sensitization : Not classified

- **Titanium dioxide** : Titanium oxide does not show respiratory sensitizing properties in animal studies or in exposure related observations in humans.

Skin sensitization : Not classified

- **Tin oxide** : No activation of the lymph nodes of mice were observed in the LLNA performed with the test material. (OECD TG 429)
- **Titanium dioxide** : In test on skin sensitization with guinea pig, skin sensitizations were not observed. (OECD Guideline 406, EU Method B.6, EPA OPP 81-6, GLP)
- **Iron oxide** : As a result of skin sensitization test using guinea pig, it does not cause skin sensitization.

Carcinogenicity : Not classified

Mutagenicity : Not classified

- **Tin oxide** : Negative reactions were observed in these in vitro genotoxicity studies (bacterial reverse mutation assay (e.g. Ames test) (gene mutation) (OECD Guideline 471), mammalian cell gene mutation assay (OECD Guideline 476), mammalian cell micronucleus test (OECD Guideline 487)).
- **Titanium dioxide** : Negative reactions were observed in in vitro (mammalian cell gene mutation test (OECD Guideline 476, GLP), mammalian chromosome aberration test (OECD Guideline 473, GLP), bacterial reverse mutation assay (OECD Guideline 471)) and in in vivo (micronucleus assay).
- **Iron oxide** : Negative reactions were observed in both in vitro (mammalian chromosome aberration test (OECD TG 473, GLP, read across), Ames test (read

across), mammalian cell gene mutation assay (OECD TG 476, GLP, read across) and in vivo comet assay.

Reproductive toxicity : Not classified

– **Titanium dioxide** : Based on the weight of evidence from the available long-term toxicity/carcinogenicity studies in rodents and the relevant information on the toxicokinetic behaviour in rats it is concluded that TiO₂ does not present a reproductive toxicity hazard.

Specific target organ toxicity (single exposure) : Not available

Specific target organ toxicity (repeat exposure) : Not classified

– **Synthetic Fluorophlogopite** : Synthetic Fluorophlogopite showed no adverse effects in a 90-day repeat dose toxicity study in rats. Synthetic Fluorophlogopite is a practically insoluble, inert mineral. Systemic effects after repeated exposure are highly unlikely.

– **Tin oxide** : No toxicity related symptoms were observed in the 13-week repeat oral administration toxicity test using rats. (NOAEL ≥ 10000 mg / kg)

– **Titanium dioxide** : Titanium dioxide did not show any adverse effects whatsoever in a chronic oral repeated dose toxicity study in rats, with a NOAEL of 3500 mg/kg bw/day. Titanium dioxide is not absorbed to any relevant extent through human skin, thus no toxic effects can be expected via the dermal route of exposure. Titanium dioxide showed fibrogenic effects in a chronic inhalation repeated dose toxicity study in rats with a NOAEC of 10 mg/m³.

– **Iron oxide** : No adverse effects were observed in sub-chronic inhalation toxicity studies for 90 days with rats. (NOAEC = 4.7 mg/m³) (OECD TG 413)

Aspiration Hazard : Not available

12. Ecological information

A. Ecological toxicity

– Acute toxicity : Not classified

– Chronic toxicity : Not classified

Fish

– **Titanium dioxide** : 96hr-NOEC(*Oncorhynchus mykiss*) > 100 mg/L (OECD Guideline 203)

– **Iron oxide** : 96hr-LC₀ (*Brachydanio rerio*) ≥ 50000 mg/L

crustacean

– **Iron oxide** : 48hr-EC₅₀ (*Daphnia magna*) > 100 mg/L (OECD TG 202, GLP)

Algae

– **Titanium dioxide** : 72hr-EC₅₀ (other) = 61 mg/L , 72hr-NOEC(*Pseudokirchnerella subcapitata*) = 12.7 mg/L

B. Persistence and degradability

Persistence

– **Tin oxide** : Low persistency (log Kow is less than 4 estimated.) (Log Kow = 1.29) (estimated)

– **Titanium dioxide** : Low persistency (log Kow is less than 4 estimated.) (Log Kow = 2.23) (estimated)

– **Iron oxide** : Low persistency (log Kow is less than 4 estimated.) (Log Kow = 0.97) (estimated)

Degradability : Not available

C. Bioaccumulative potential

Bioaccumulation

– **Tin oxide** : Bioaccumulation is expected to be low according to the BCF < 500 (BCF = 100) (estimated)

- **Titanium dioxide** : Bioaccumulation is expected to be low according to the BCF < 500 (BCF = 13.73) (estimated)
- **Iron oxide** : Bioaccumulation is expected to be low according to the BCF < 500 (BCF = 3.162) (estimated)

Biodegradation

- **Tin oxide** : not readily biodegradable (estimated)
- **Titanium dioxide** : not readily biodegradable (estimated)
- **Iron oxide** : not readily biodegradable (estimated)

D. Mobility in soil

- **Tin oxide** : Low potency of mobility to soil. (Koc = 13.16) (estimated)
- **Titanium dioxide** : Low potency of mobility to soil. (Koc = 86.1) (estimated)
- **Iron oxide** : Low potency of mobility to soil. (Koc = 6.942) (estimated)

E. Other hazardous effect : Not available

F. HAZARDOUS TO THE OZONE LAYER : Not classified

13. Disposal considerations

A. Disposal method

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

B. Disposal precaution

Consider the required attentions in accordance with waste treatment management regulation.

14. Transport information

A. UN Number Not applicable

B. UN Proper shipping name Not applicable

C. Transport Hazard class Not applicable

D. Packing group Not applicable

E. Marine pollutant Not applicable

F. IMDG/IATA/ICAO Not applicable

G. Special precautions

in case of fire Not applicable

in case of leakage Not applicable

15. Regulatory information

A. Occupational Safety and Health Regulation

Tin Oxide : Work environment monitoring listed (6 months)

Tin Oxide : Administration subject listed

Titanium Dioxide : Administration subject listed

Titanium Dioxide : Occupational exposure limits listed

Titanium Dioxide : Work environment monitoring listed (6 months)

Iron Oxide : Administration subject listed

Iron Oxide : Occupational exposure limits listed

Iron Oxide : Work environment monitoring listed (6 months)

Iron Oxide : Health examination agent (12 months)

B. Chemical Control Act

Synthetic Fluorphlogopite : Existing Chemical Substance KE-17066
Tin oxide : Existing Chemical Substance (KE-33849)
Titanium dioxide : Existing Chemical Substance KE-33900
Iron oxide : Existing Chemical Substance (KE-10897)

C. Dangerous Material Safety Management Regulation

Tin oxide : Dangerous Material Safety Management Regulation
Titanium dioxide : Dangerous Material Safety Management Regulation
Iron oxide : Dangerous Material Safety Management Regulation

D. Wastes Control Act

Synthetic Fluorphlogopite : Wastes Control Act Controlled Wastes

E. Other regulation (internal and external)

Internal information

Persistent Organic Pollutants Acts : Not regulated

② **Foreign Regulatory Information**

External information

EU classification(classification)

Tin oxide : Not classified
Titanium dioxide : Not classified
Iron oxide : Not classified

EU classification(risk phrases)

Tin oxide : Not applicable
Titanium dioxide : Not applicable
Iron oxide : Not applicable

EU classification(safety phrases)

Tin oxide : Not applicable
Titanium dioxide : Not applicable
Iron oxide : Not applicable

EU SVHC list : Not regulated

EU Authorisation List : Not regulated

EU Restriction list : Not regulated

U.S.A management information (OSHA Regulation) : Not regulated

U.S.A management information (CERCLA Regulation) : Not regulated

U.S.A management information (EPCRA 302 Regulation) : Not regulated

U.S.A management information (EPCRA 304 Regulation) : Not regulated

U.S.A management information (EPCRA 313 Regulation) : Not regulated

Substance of Roterdame Protocol : Not regulated

Substance of Stockholme Protocol : Not regulated

Substance of Montreal Protocol : Not regulated

Foreign Inventory Status

Synthetic Fluorphlogopite

Australia management information Inventory of Chemical Substances (AICS): Present

Canada Manegement Informaton Domestic Substances List (DSL): Present

China manegement information Inventory of Existing Chemical Substances (IECSC): Present

New Zealand manegement information Inventory of Chemicals (NZIoC): May be used as a component in a product covered by a group standard but it is not approved for use as a chemical in its own right.

Phillippines manegement information Inventory of Chemicals and Chemical Substances (PICCS): Present

U.S.A management information Section 8(b) Inventory (TSCA): Present

Tin oxide

U.S.A management information Section 8(b) Inventory (TSCA): Present
Japan management information Existing and New Chemical Substances (ENCS): (1)–551
Japan management information ISHL Harmful Substances Whose Names Are to be Indicated on the Label: $\geq 1\%$ weight
Japan management information ISHL Notifiable Substances: $\geq 0.1\%$ weight
China management information Inventory of Existing Chemical Substances (IECSC): Present 37645
Canada management information Domestic Substances List (DSL): Present
Australia management information Inventory of Chemical Substances (AICS): Present
New Zealand management information Inventory of Chemicals (NZIoC): HSNO Approval: HSR002805
Philippines management information Inventory of Chemicals and Chemical Substances (PICCS): Present

Titanium dioxide

U.S.A management information Section 8(b) Inventory (TSCA): Present
Japan management information Existing and New Chemical Substances (ENCS): (5)–5225, (1)–558
Japan management information ISHL Harmful Substances Whose Names Are to be Indicated on the Label: $\geq 1\%$ weight
Japan management information ISHL Notifiable Substances: $\geq 0.1\%$ weight
China management information Inventory of Existing Chemical Substances (IECSC): Present 11377
Canada management information Domestic Substances List (DSL): Present
Australia management information Inventory of Chemical Substances (AICS): Present
New Zealand management information Inventory of Chemicals (NZIoC): May be used as a single component chemical under an appropriate group standard.
Philippines management information Inventory of Chemicals and Chemical Substances (PICCS): Present

Iron oxide

U.S.A management information Section 8(b) Inventory (TSCA): Present
Japan management information Existing and New Chemical Substances (ENCS): (5)–5188, (1)–357
Japan management information ISHL Harmful Substances Whose Names Are to be Indicated on the Label: $\geq 1\%$ weight
Japan management information ISHL Notifiable Substances: $\geq 1\%$ weight
China management information Inventory of Existing Chemical Substances (IECSC): Present 29712
Canada management information Domestic Substances List (DSL): Present
Australia management information Inventory of Chemical Substances (AICS): Present
New Zealand management information Inventory of Chemicals (NZIoC): May be used as a single component chemical under an appropriate group standard.
Philippines management information Inventory of Chemicals and Chemical Substances (PICCS): Present

16. Other information

A. Information source and references

Emergency Response Guidebook 2008;
http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/erg2008_eng.pdf
U.S. National library of Medicine(NLM) Hazardous Substances Data Bank(HSDB);
<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>
U.S. National library of Medicine(NLM) ChemIDplus; <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CHEM>
National Emergency Management Agency–Korea dangerous material inventory management system; <http://www.nema.go.kr/hazmat/main/main.jsp>
Korea Occupational Health & Safety Agency; <http://www.kosha.net>
EPISUITE v4.11; <http://www.epa.gov/opt/exposure/pubs/episuitedl.html>
Ministry of Public Safety and Security–Korea dangerous material inventory management system; <http://hazmat.mpss.kfi.or.kr/index.do>
IARC Monographs on the Evaluation of Carcinogenic Risks to Humans;
<http://monographs.iarc.fr>
TOMES–LOLI®; <http://www.rightanswerknowledge.com/loginRA.asp>
National Chemicals Information System; <http://ncis.nier.go.kr/ncis/>
Waste Control Act enforcement regulation attached [1]
REACH information on registered substances; <https://echa.europa.eu/information-on-chemicals/registered-substances>
American Conference of Governmental Industrial Hygienists TLVs and BEIs.
NIOSH Pocket Guide; <http://www.cdc.gov/niosh/npg/npgdcas.html>
National Institute of Technology and Evaluation(NITE);
<http://www.safe.nite.go.jp/english/db.html>
National Toxicology Program; <http://ntp.niehs.nih.gov/results/dbsearch/>
REACH information on registered substances;
<http://apps.echa.europa.eu/registered/registered-sub.aspx>
International Uniform Chemical Information Database(IUCLID)
Korea Maritime Dangerous Goods Inspection Center; <http://www.komdi.or.kr/index.html>
EU CLP; <https://echa.europa.eu/information-on-chemicals/cl-inventory-database>

B. Issuing date 09–10–2006

C. Revision number and date

revision number 7

date of the latest revision 01–04–2024

D. Others

- Since the user's working conditions are not known by us, the information supplied on this safety data sheet is based on our current level of knowledge and on national and community regulations.
- The product must not be used for any purposes other than those specified under heading 1 without first obtaining written handling instructions.
- It is at all times the responsibility of the user to take all necessary measures to comply with legal requirements and local regulations.
- The information given on this safety data sheet must be regarded as a description of the safety requirements relating to our product and not a guarantee of its properties.