

## Safety Data Sheet

Reference No. 1039

Issue: 25th June 1999  
Revision: 16th February 2026

### 1. Chemical product and company identification

Product name	PACKTEST Sulfide (Hydrogen Sulfide)	Model	WAK-S
Company name	KYORITSU CHEMICAL-CHECK Lab., Corp		
Address	1-18-2 Hakusan, Midori-ku, Yokohama, Kanagawa 226-0006, JAPAN		
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Recommended uses and restrictions    Reagent for water quality measurement

### 2. Hazards identification

#### [GHS Classification]

Physical hazards:	Classification not possible (no data for GHS classification available)
Health hazards:	
Acute toxicity Inhalation (Dusts/Mists):	Category 4 (applicable only K-1 reagent)
Skin corrosion/irritation:	Category 1 (applicable only K-1 reagent)
Serious eye damage/eye irritation:	Category 1 (applicable only K-1 reagent)
	Category 2B (applicable only K-2 reagent)
Respiratory or skin sensitization:	Category 1 (respiratory sensitization) (applicable only K-1 reagent)
Specific target organ toxicity (single exposure):	Category 2 (respiratory organs, systemic toxicity)
	(applicable only K-1 reagent)
	Category 2 (digestive tract) (applicable only K-2 reagent)
Specific target organ toxicity (repeated exposure):	Category 2 (teeth, respiratory organs) (applicable only K-1 reagent)
For those health hazards not listed above are not classified or classification not possible (no data for GHS classification available)	
Environmental hazards:	
Hazards to the aquatic environment-Acute:	Category 2 (applicable only K-1 reagent)
For those environmental hazards not listed above classifications not possible (no data for GHS classification available)	

#### [GHS labeling elements]



#### [Signal word]

Danger

#### [Hazard statements]

(All statements are applicable only for K-1 reagent as below.)

Toxic if inhaled.  
 Causes severe skin burns and eye damage.  
 Causes serious eye damage.  
 May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
 May cause damage to respiratory organs and systemic toxicity.  
 May cause damage to teeth and respiratory organs through prolonged or repeated exposure.  
 Toxic to aquatic life.

(All statements are applicable only for K-2 reagent as below.)

Causes eye irritation.  
 May cause damage to digestive tract.

**[Precautionary statements]**

Keep out of reach of children and store in the dry and dark place at room temperature.  
 Carefully read instructions before use and do not use for other purposes.  
 Wear personal protective equipment if necessary.  
 Do not inhale reagents.  
 Wash contaminated clothing.  
 Wash hands thoroughly before and after handling.  
 Avoid release to the environment.

**3. Composition/ information on ingredients**

Discrimination of single substance or mixture: Mixture

Reagent name	K-1 reagent			K-2 reagent		
Chemical name	Hydrochloric acid	Ferric (III) chloride hexahydrate	Water	Sodium Sulfate	Other (not regulated)	Poly-ethylene
Content	5 - 9.9 %	5 - 9.9 %	80 - 89 %	5 - 9.9 %	0.01 – 0.09 %	90 - 99 %
Chemical formula	HCl	FeCl <sub>3</sub> ·6H <sub>2</sub> O	H <sub>2</sub> O	Na <sub>2</sub> SO <sub>4</sub>	-	(C <sub>2</sub> H <sub>4</sub> ) <sub>n</sub>
METI No. (reference number under CSCL in Japan)	(1)-215	(1)-213	-	(1)-501	-	(6)-1
CAS No.	7647-01-0	10025-77-1	7732-18-5	7757-82-6	-	9002-88-4

**4. First-aid measures**

If reagents or developed sample;

Enter in eyes: Immediately rinse eyes with water for more than 15 minutes followed by the treatment by an ophthalmologist.

Contact with skin: Immediately wash out contaminated site with plenty of water.

Enter into mouth: Immediately rinse mouth with plenty of water.

If any symptoms appear after above measures, immediately get medical advice or treatment.

Especially in case ingested reagents or developed sample, drink plenty of milk or water and immediately get medical advice or treatment.

**5. Fire-fighting measures**

Extinguishing methods: Cut off ignition sources and extinct by a suitable media.

Suitable extinguishing media: Water (mist), powder, carbon dioxide and dry sand.

**6. Accidental release measures**

In case of outdoor use: Avoid spill of reagents or waste solutions.

In case of indoor use: If spilled on a table or floor, wipe off immediately spilled reagents and dispose of them.

Concentrated solutions should not be released into sewer or rivers.

**7. Handling and storage**

Handling: Avoid eyes contact, skin contact, ingestion and inhalation of reagents.

pHs of K-1 reagent and a sample after the addition of reagent are <2. Similar attention is necessary.

Especially for outdoor use, ensure to bring back reagents, liquid waste after the measurement and used containers.

Storage: Avoid direct sunlight and store in a well-ventilated, cool, dry and dark place.

**8. Exposure controls and personal protection**

## Administrative control level

Working environment standard: Not established

## Occupational exposure limits

Japan Society for Occupational health: 5 ppm (7.5 mg/m<sup>3</sup>) (only Hydrochloric acid)  
OSHA(PEL): air Cl 5 ppm (only Hydrochloric acid)  
ACGIH (TLVs): Cl 5 ppm (only Hydrochloric acid)  
ACGIH (TLVs): TWA 1 mg (Fe)/m<sup>3</sup> (only Ferric (III) chloride hexahydrate)  
Protective equipment: Recommend to wear protective glasses and gloves

## 9. Physical and chemical properties

Physical state: K-1: Liquid reagent 5 mL x 1 plastic bottle in a plastic bag  
K-2: Tube containing powder reagent  
1.1 g x 40 tubes/kit (5 tubes per one aluminum laminated packaging)  
Color: K-1: yellow (liquid), K-2: white (powder), semi-transparent (polyethylene tube)  
Odor: K-1: no odor, K-2: no odor  
pH: ≤ 1 (K-1 reagent, developed sample)

Melting point, boiling point, flash point, ignition point, lower explosion limit, vapor pressure, density, relative density, solubility, Pow, kinetic viscosity: not available as a mixture

## 10. Stability and reactivity

Avoid leaving in a place where high temperature, humid or under direct sunlight. Stable under normal use conditions and no dangerous reactions under specific conditions are expected. No information on hazardous decomposition product is available.

## 11. Toxicological information

No data on mixture is available. Data on K-1 and K-2 reagents are shown below.

## K-1 reagent

Hydrochloric acid (gas) (no data on solution is available):

## Acute toxicity:

Oral: Classified as Category 3 based on data; Rat: LD<sub>50</sub> = 238 ~ 277, 700 mg/kg (SIDS (2002)).Dermal: Not classified based on data; Rabbit LD<sub>50</sub> ≥ 5,010 mg/kg (SIDS (2002)).Inhalation (gas): Classified as Category 3 based on data; 1,411 ppm was obtained from statistical calculation of converted value of rats: LC<sub>50</sub> = 4.2 mg/L, 4.7 mg/L, 238 mg/L/60 min (SIDS (2002)).Inhalation (dust, mist): Classified as Category 2 based on data; Rat LC<sub>50</sub> (aerosol) = 1.68 mg/L/1hr (SIDS (2002)) which is equivalent to 0.42 mg/L/4hr.

Skin corrosion/ irritation: Classified as Category 1A – 1C based on data; Rabbit: Corrosive to the skin by 1 – 4 hour exposure depending on concentrations (SIDS (2002)). Mouse, rat: Skin irritation and inflammation associated with changes of color by 5 – 30 minutes exposure (SIDS (2002)). Human: Mild to severe irritation, ulcer and skin burns (SIDS (2002)).

Serious eye damage/ eye irritation: Skin corrosion is classified as Category 1. Data of serious damage and eye irritation was obtained by exposure of hydrochloric acid solution.

Classified as Category 1 based on data; Causes serious eye irritation, damage and corrosion in multiple animal tests including rabbits (SIDS (2002)). It also reported that may cause persistent eye damage and blindness in humans (SIDS (2002)). It is classified as C, R34 in the EU classification

## Respiratory or skin sensitization

Respiratory sensitization: Classified as Category 1 based on data; Japanese Society of Occupational and Environmental Allergy lists as an occupational sensitizer. It is reported that caused bronchial spasm after the exposure of cleaning product containing hydrochloric acid furthermore caused asthma by a limited irritation after one year of the incident. (ACGIH (2003)).

Skin sensitization: Not classified based on data; Negatives in a guinea pig maximization test and a mouse ear swelling tests (SIDS (2002)) and no positive case was found among 15 people applied after 10 – 14 days of induction (SIDS (2002)).

Germ cell mutagenicity: Classification is not possible because; No in vivo test data. Result of Ames test is negative. Result of In vitro chromosomal aberration assay is false positives due to low pH.

Carcinogenicity: Not classified based on data; IARC Group 3 (1992), ACGIH A4 (2003). No evidence which indicates carcinogenicity, was reported in rats and mice studies (SIDS (2002)). Epidemiological studies

are of negative regarding relationships between carcinogenicity and exposure of hydrochloric acid (IARC 54 (1992), PATTY 5th (2001)).

Reproductive toxicity: Classification is not possible because of data lack based on available data; No developmental effect was observed in rats and mice administered during pregnancy period.

Effects on reproduction or fertility are not known if exposed before mating or during early developmental stage.

Specific target organ toxicity (single exposure): Classified as Category 1 (respiratory organs) based on animal and human data; Following effects in humans are reported by inhalation exposure; breathing difficulty, inflammation of pharynx, bronchitis, bronchoconstriction, pneumonia, effects on upper airways such as edema, inflammation and necrosis and lung edema (DFGOT vol.6 (1994), PATTY 5th (2001), IARC 54 (1992), ACGIH (2003)).

In animal test also reported that toxicological and morphological effects in lungs and bronchial tubes were observed e.g. bronchitis associated with necrosis of mucous membranes, lung edema, bleeding and thrombus (ACGIH (2003), SIDS (2002)).

Specific target organ toxicity (repeated exposure): Classified as Category 1 (teeth and respiratory organs) based on data; Damages of teeth by diabrosis in multiple cases are reported in human repeated exposure (SIDS (2002), EHC 21 (1982), DFGOT vol.6 (1994), PATTY 5th (2001), ). It is also reported that increased incidence of chronic bronchitis (DFGOT vol.6 (1994)).

Aspiration Hazard: Hydrochloric acid is gas state in GHS definition.

Ferric (III) chloride hexahydrate, Water:

Data: Not available

#### K-2 reagent

Sodium sulfate:

Acute toxicity (Oral): Not classified

LD50 for rats: >10,000 mg/kg (SIDS (2006))

Skin corrosion/irritation: Not classified

[Rationale for the Classification]

Based on (1) and (2), it was classified as "Not classified."

[Evidence Data]

(1) In a skin irritation test according to OECD TG 404 with rabbits, it was concluded as not irritating (SIDS (2006), REACH registration dossier (Access on September 2019)).

(2) This substance is not irritating to the skin and slightly irritating to the eyes. Sensitising effects are highly unlikely (SIDS (2006)).

Serious eye damage/eye irritation: Category 2B

Based on (1) and (2), it was classified in Category 2B.

(1) In an eye irritation test according to OECD TG 405 with rabbits, it was concluded to be slightly irritating, and all the effects were reversible within 7 days (SIDS (2006), REACH registration dossier (Access on September 2019)).

(2) This substance is not irritating to the skin and slightly irritating to the eyes. Sensitising effects are highly unlikely (SIDS (2006)).

Skin sensitization: Not classified

Based on (1) and (2), it was classified as "Not classified."

(1) In a skin sensitization test (maximization method) according to OECD TG 406 with guinea pigs, no skin reaction was observed, and it was concluded to be negative (REACH registration dossier (Accessed on September 2019)).

(2) This substance is not irritating to the skin and slightly irritating to the eyes. Sensitising effects are highly unlikely (SIDS (2006)).

Germ cell mutagenicity: Not classified

There is no in vivo data for this substance, however, based on the weight of evidence (WoE), according to (1), it was classified as "Not classified."

(1) As for in vitro, there are reports of negative results in a bacterial reverse mutation test and a mammalian cell chromosomal aberration test (SIDS (2006), Risk Assessment Report (Food additives)\_Potassium sulfate (Food Safety Commission, 2013)). It is concluded, as a comprehensive decision, in the evaluation in Risk Assessment Report (Food additives) (Food Safety Commission, 2013) that the food additive "potassium sulfate (CAS RN 7778-80-5)" has no genotoxicity of any particular concern for living organisms since negative results were obtained in all tests using salts of sulfuric acid.

Specific target organ toxicity - Single exposure: Category 1 (gastrointestinal tract)

Based on (1), it was classified in Category 1 (gastrointestinal tract).

(1) This substance was once used as a laxative in humans for medical purposes in oral doses of about 300 mg/kg up to 20 g maximum, but it has been gradually abandoned due to severe diarrhea and abdominal cramping (SIDS (2006)).

Specific target organ toxicity - Repeated exposure: Not classified

Based on (1) and (2), it was classified as "Not classified" for the inhalation and oral routes.

- (1) In a cross-sectional study among 119 male workers exposed to the dust of this substance for 2 months to 31 years, mean urinary excretion of inorganic sulfates exceeding 2.2 g/L in all workers was detected, and 30% of the workers excreted more than 3 g/day of inorganic sulfates. The only symptom indicated by the workers was nasal irritation and runny noses (SIDS (2006)).
- (2) In a 4-week feeding study with male rats, no toxic effects were observed at up to the highest dose of ca. 2,000 mg/kg/day.

Polyethylene: No toxicological information available.

GHS classification results of K-1 and K-2 reagents as mixtures are shown below.

[Acute toxicity (inhalation: dusts/mist)]

K-1 reagent: Classified as Category 4 (Warning, Toxic if inhaled.) Based on application of additive equation of LC<sub>50</sub> (rat) values of ingredients.

[Skin corrosion/ irritation]

K-1 reagent: Classified as Category 1 (Danger, Causes severe skin burns and eye damage.) because it contains more than 5% of category 1.

[Serious eye damage/ eye irritation]

K-1 reagent: Classified as Category 1 (Danger, Causes serious eye damage.) because it contains more than 3% of category 1.

K-2 reagent: Classified as Category 2B (Warning, Causes eye irritation.) because it contains more than 3% of category 2B.

[Respiratory or skin sensitization]

K-1 reagent: Classified as Category 1 (Danger, May cause allergy or asthma symptoms or breathing difficulties if inhaled.) because it contains more than 1% of category 1 (respiratory sensitization).

[Specific target organ toxicity (single exposure)]

K-1 reagent: Classified as Category 2 (Warning, May cause damage to respiratory organs and systemic toxicity.) because it contains 1 to 10% of category 1.

K-2 reagent: Classified as Category 2 (Warning, May cause damage to digestive tract.) because it contains 1 to 10% of category 1.

[Specific target organ toxicity (repeated exposure)]

K-1 reagent: Classified as Category 2 (Warning, May cause damage to teeth and respiratory organs through prolonged or repeated exposure.) because it contains 1 to 10% of category 1.

K-1 and K-2 reagents: [Acute toxicity (oral)], [Germ cell mutagenicity], [Carcinogenicity], [Reproductive toxicity], [Aspiration hazard] and;

K-2 reagent: [Skin corrosion/ irritation], [Respiratory or skin sensitization], [Specific target organ toxicity (repeated exposure)]

Not classified or classifications are not possible because of data lack.

## 12. Ecological information

No data on mixture is available. Data on K-1 and K-2 reagents are shown below.

K-1 reagent

Hydrochloric acid:

Hazardous to aquatic environment, short-term (acute): Classified as Category 1 based on data; Crustacea (*Daphnia magna*): 48-h EC<sub>50</sub> = 0.492 mg/L (SIDS, 2005).

Hazardous to aquatic environment, long-term (chronic): Not classified because it is considered that toxicity is manifested by acidity of solution however it should be lowered in the environment because of buffering effects

Other data: Not available.

Ferric (III) chloride hexahydrate: No eco-toxicological information is available.

K-2 reagent

Sodium sulfate:

Hazardous to the aquatic environment, short-term (acute): Not classified

It was classified as "Not classified" from 72-hour EC<sub>50</sub> = 1,584.583 mg/L for algae (*Pseudokirchneriella subcapitata*) (AQUIRE, 2019, Simmons, 2012), 48-hour EC<sub>50</sub> = 3,150.21 mg/L for crustacea (*Ceriodaphnia dubia*) (AQUIRE, 2019, Soucek, 2007), and 96-hour LC<sub>50</sub> = 7,960 mg/L for fish (*Pimephales promelas*) (AQUIRE, 2019, Mount, 1997).

Hazardous to the aquatic environment, long-term (chronic): Not classified

It was classified as "Not classified" from 72-hour NOEC = 1,060 mg SO<sub>4</sub>/L (a converted value equivalent to NaSO<sub>4</sub>: 1,265 mg/L) for algae (*Pseudokirchneriella subcapitata*), 7-day NOEC = 610 mg SO<sub>4</sub>/L (a

converted value equivalent to NaSO<sub>4</sub>: 728 mg/L) for crustacea (Ceriodaphnia dubia), and 31-day NOEC = 205 mg SO<sub>4</sub>/L for fish (Oncorhynchus mykiss) (a converted value equivalent to NaSO<sub>4</sub>: 245 mg/L) (all, AQUIRE, 2019, Elphick, 2011), although environmental dynamics of the inorganic compound is unknown.

Polyethylene: No eco-toxicological information is available.

GHS classifications as a mixture are shown below.

[Hazardous to aquatic environment, short-term (acute)]

K-1 reagent: Classified as Category 2 (Toxic to aquatic life.)

Based on the equation  $1 (M=1) \times 10 \times \text{less than } 10\% = 25 \text{ to } 100\%$

K-2 reagent: Classification is not possible because of data lack.

[Hazardous to aquatic environment, long-term (chronic)]

K-1 and K-2 reagents: Classifications are not possible because of data lack.

[Harmful effects on the ozone layer]:

Every reagent: Classification is not possible because each of the substances is not described in Annex to Montreal Protocol.

### 13. Disposal considerations

pHs of remaining K-1 reagent and liquid waste after the measurement are  $\leq 2$ . Liquid Waste contains ca. 2 mg of iron per measurement.

Always dispose according to local regulations.

### 14. Transport information

In addition to precautionary measures regarding handling and storage, avoid rough handling so as not to break containers. It is recommended to ship by air because under high temperature for long period may lead to deterioration.

UN classification and number: 3264  
Proper shipping name: Corrosive liquid, acidic, inorganic, n.o.s. (applicable only K-1 reagent)  
UN classification: Class 8 (Corrosives)  
Packing group: II  
Civil Aeronautics Act: Same as above. Applicable for Excepted Quantities of Dangerous Goods.  
Fire Service Act: Not applicable  
Total weight of the product: ca.150 g/kit

### 15. Regulatory information

Poisonous and Deleterious Substances Control Act: Not applicable

PRTR Act: Not applicable

Industrial Safety and Health Act: Applicable

K-1 reagent contains more than 1% of Hydrochloric acid and Ferric (III) chloride hexahydrate.

: "Cabinet order, article 18, shall be notified the Name of the substances, #2"

: "Cabinet order, article 18-2, shall be indicated the Name of the substances, #2"

: "Designated substances class 3"

K-2 reagent contains more than 1% of Sodium Sulfate.

: "Cabinet order, article 18, shall be notified the Name of the substances, #2"

: "Cabinet order, article 18-2, shall be indicated the Name of the substances, #2"

Waste Disposal and Cleaning Act: Applicable

Applicable to the Special Controlled Industrial Waste of the Act because pHs of remaining K-1 reagent and liquid waste after measurement are less than 2.

### 16. Other information

Reference literature

NITE, GHS Classification, ID21 B3004 Hydrochloric acid (2010.02.01)

Safety Data Sheet, W01W0109-0087 JGHEEN, FUJIFILM Wako Pure Chemical Corporation (2024.2.26)

Safety Data Sheet, W01W0104-2835 JGHEEN, FUJIFILM Wako Pure Chemical Corporation (2024.5.17)

NITE, GHS Classification, ID:m-nite-7757-82-6\_v1 Sodium sulfate

Safety Data Sheet No. A5111003300, TOSOH CORPORATION (2023.9.27)  
Koukuu Kikenbutsu Yusou Houeisyu, Ed. MLIT, HOUBUN SHORIN CO., LTD. (2019)  
JIS Z 7252:2019 Classification of chemicals based on "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)" (Japanese Industrial Standards Committee)  
JIS Z 7253:2019 Hazard communication of chemicals based on GHS-Labeling and Safety Data Sheet (SDS) (Japanese Industrial Standards Committee)  
UN GHS (tentative translation, forth revised version), GHS Kankei Syocho Renraku Kaigi (2011)  
Ministry of Economy, Trade and Industry, GHS Classification Guidance for Enterprises 2013 Revised Edition (2013)

NOTE) This information is not always exhaustive and use with care.  
This data sheet only provides information but any description cannot be warranted.  
Descriptions may possibly be changed because of new findings or modification of the current knowledge.  
Precautions only cover normal handling.  
This English SDS is prepared in the cooperation with the Chemicals Evaluation and Research Institute (CERI), Japan.