SAFETY DATA SHEET

Date: August 21, 2012
Revision:

1. Identification of the substance or mixture and of the supplier
1.1 Product identifier
   Reference No.
   Product name        KIH-485 85%WG
   Synonyms            Pyroxasulfone; Pyroxasulfone 85 WG; SAKURA®; Zidua®

1.2 Recommended use of the chemical and restrictions on use
   Research purposes only

1.3 Supplier's details
   Manufacturer and address  Kumiai Chemical Industry Co., Ltd.
                            1-4-26, Ikenohata, Taitoh-ku, Tokyo 110-8782
                            Japan

   Person responsible for SDS  Eisuke Ozaki, Research & Development Dept.
   Telephone                +81-(0)3-3822-5174
   Telefax                 +81-(0)3-3822-5005
   e-mail                   soumu@kumiai-chem.co.jp

1.4 Emergency telephone (not available outside office hours)
   Telephone in Japan        +81-(0)3-3822-5174

2. Hazard identification
   Classification of the mixture
2.1 Physical hazards

2.2 Health hazards
   Acute toxicity
      Oral                  Not classified
      Dermal               Not classified
      Inhalation (gas)     Not applicable
      (vapour)             Classification not possible
      (mist/dust)          Not classified

   Skin corrosion/irritation    Not classified
   Serious eye damage/eye irritation    Not classified
   Respiratory sensitization    Classification not possible
   Skin sensitization          Category 1
   Germ cell mutagenicity      Not classified
   Carcinogenicity             Category 1A
   Reproductive toxicity       Not classified
   Specific target organ toxicity
      (single exposure)     Not classified
   Specific target organ toxicity
      (Repeated exposure)  Category 1 (liver, kidney, urinary bladder, cardiovascular system)
   Aspiration hazard          Classification not possible
2.3 Environmental hazard
Hazardous to the aquatic environment
Acute aquatic toxicity Category 1
Chronic aquatic toxicity Category 1

2.4 Label elements
Pictograms or hazard symbols

Signal words Danger (code)
Hazard statements
May cause an allergic skin reaction H317
May cause cancer H350
May cause cancer H350
Causes damage to organs (respiratory system, kidney, liver, urinary bladder, cardiovascular system) through prolonged or repeated exposure. H372
Very toxic to aquatic life. H400
Very toxic to aquatic life with long-lasting effects. H410

Precautionary statements
Safety precautions
Obtain special instructions before use. P201
Do not handle until all safety precautions have been read and understood. P202
Do not breathe dust/fume/gas/mist/vapours/spray. P260
Wash hands thoroughly after handling P264
Do not eat, drink or smoke when using this product. P270
Contaminated work clothing should not be allowed out of the workplace. P272
Avoid release to the environment if this is not the intended use. P273
Wear protective gloves/protective clothing/eye protection/face protection. P280

First-aid measures
IF ON SKIN: Wash with plenty of soap and water. P302+P352
Get medical advice/attention if you feel unwell. P314
If skin irritation or rash occurs: Get medical advice/attention. P333+P313
Specific treatment (see first aid instructions in Section 4 on this SDS) P321
Take off contaminated clothing and wash it before reuse. P362+P364
Collect spillage. P391

Storage conditions
Store locked up. P405

Disposal methods
Dispose of contents/container in accordance with local regulation. P501

3. Composition/information on ingredients
Substance/Mixture Mixture
Composition Ingredients CAS number Concentration
Pyroxasulfone 447399-55-5 85%
Crystalline silica  14808-60-7  < 0.15%
Other Ingredient  (Non-hazardous)  to balance

Active ingredient  Pyroxasulfone
Chemical name (IUPAC)  3-[5-(difluoromethoxy)-1-methyl-3-(trifluoromethyl)pyrazol-4-ylmethylsulfonyl]-4,5-dihydro-5,5-dimethyl-1,2-oxazole
Common name (ISO)  Pyroxasulfone
Synonyms  Sakura®, Zidua®, KIH-485
Molecular formula  C_{12}H_{14}F_{5}N_{3}O_{4}S

4. First aid measures
4.1 Description of necessary first-aid measures
   Inhalation  Move person to fresh air and keep at rest. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control centre or doctor for further treatment advice.
   Skin contact  Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control centre or doctor for treatment advice.
   Eye contact  Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes and then continue rinsing. Call a poison control centre or doctor for treatment advice.
   Ingestion  Call a poison control centre or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to by a poison control centre or doctor. Do not give any thing to an unconscious person.

4.2 Most important symptoms/effects, acute and delayed
   Not available

4.3 Indication of immediate medical attention and special treatment needed, if necessary
   Not available

5. Fire-fighting measures
5.1 Suitable extinguishing media
   Suitable extinguishing media  Carbon dioxide (CO₂), extinguishing powder A/B/C, foam, atomized water, or sand.
   Unsuitable extinguishing media  Rod-like water

5.2 Special hazards arising from the chemical
   CO, CO₂, SO, SO₂, nitrogen oxides, sulphur oxides, hydrogen fluoride and hydrogen cyanide may be released in a fire.

5.3 Special protective actions for firefighters
   Wear self-contained breathing apparatus and full protective equipment. If possible and without risk, remove intact containers from exposure to fire. Contain firefighting water by bunding area with sand or earth to prevent it entering any bodies of water. Dispose if fire control water or other extinguishing agent and spillage safely later.

6. Accidental release measures
6.1 Personal precautions, protective equipment and emergency procedures
Wear appropriate protective gears to avoid breathing vapour and contact with skin, eyes or clothing when working on a spill (see Section 8). Ventilate the closed area.

6.2 Environmental precautions
Avoid release to the environment.

6.3 Methods and materials for containment and cleaning up
Collect by sweeping or suction into hermetically sealed containers and dispose of according to local Regulations. Prevent spills from entering sewers, watercourses or low areas. Remove all sources of ignition; flares, smoking or flames in the area immediately.

7. Handling and storage
7.1 Precautions for safe handling
Keep out of reach of children. Avoid ingestion. Avoid contact with skin, eyes or clothing. Avoid inhalation of dust. When preparing the spray and using the prepared spray, wear cotton overalls buttoned to the neck and wrist, elbow-length gloves and goggles. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco. Remove and wash contaminated clothing/PPE before reuse.

7.2 Conditions for safe storage, including any incompatibilities
Store in the closed, original container in a cool, well-ventilated area. Do not store for prolonged periods in direct sunlight. Keep away from heat, steam pipe or combustible materials. Keep away from food, drink and animal feeding stuffs.

8. Exposure controls/personal protection
8.1 Control parameters
Not established

8.2 Occupational exposure limit values or biological limit values
Not established

8.3 Appropriate engineering controls
Avoid creation of dust. Control process conditions to avoid contact. Use in a well ventilated area only. Refer to the product label. Make available emergency shower and eye washes in a work area and storage area. Make available local exhaust ventilation and use sealed equipment to avoid exposure.

8.4 Individual protection measures, such as personal protective equipment
Eye protection Wear safety goggles as appropriate.
Skin protection Wear gloves, protective garment (coverall) and boots as appropriate.
Respiratory protection Wear chemical cartridge respirator with an organic vapour cartridge, airline respirator, positive pressure self-contained breathing apparatus as appropriate.

9. Physical and chemical properties
Appearance (physical state, colour etc.) Light brown, granule
Odour Characteristic odor
Odour threshold Not relevant
pH ~9.5 (1% dilution in water)
Melting point/freezing point Not available (130.7°C -- pyroxasulfone)
Initial boiling point/boiling range Not available

SDS KIH-485 85%WG 4/7
10. Stability and reactivity

10.1 Reactivity

- Not available

10.2 Chemical stability

- Stable under normal conditions of storage and use

10.3 Possibility of hazardous reactions

- Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

10.4 Conditions to avoid

- Avoid sources extremes of temperature and direct sunlight

10.5 Incompatible materials

- None known

10.6 Hazardous decomposition products

- Carbon dioxide, carbon monoxide, nitrogen oxides, sulphur oxides, hydrogen fluoride and hydrogen cyanide may be released in a fire.

11. Toxicological information

<table>
<thead>
<tr>
<th>Acute toxicity</th>
<th>Oral (rat)</th>
<th>LD_{50} &gt; 2,000 mg/kg</th>
<th>Not classified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermal (rat)</td>
<td>LD_{50} &gt; 2,000 mg/kg</td>
<td>Not classified</td>
<td></td>
</tr>
<tr>
<td>Inhalation (mist/dust)</td>
<td>LC_{50} &gt; 5.8 mg/L</td>
<td>Not classified</td>
<td></td>
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</tbody>
</table>

**Chronic Toxicity [Information on Pyroxasulfone]**

A chronic toxicity study in dogs produced effects on nerve tissues, skeletal muscles, and clinical chemistry enzymes related to muscle tissues.

**Skin corrosion/irritation**

- Not classified

**Mild irritant**

**Serious eye damage/irritation**

- Not classified

**Moderately irritating**
12. Ecological information

Acute aquatic toxicity
   Category 1
   Classified as Category 1 because ErC50 (96h) to algae was 0.00263 mg/L.

Chronic aquatic toxicity
   Category 1
   Classified as Category 1 because the product is classified as Category 1 in acute aquatic
toxicity and is thought of as lack of rapid degradability (BIOWIN).

12.1 Toxicity

Fish (carp)  \[ LC_{50} (96 \text{ h}) > 1,000 \text{mg/L} \]
\[ Daphnia magna \]  \[ EC_{50} (48 \text{ h}) > 1,000 \text{mg/L} \]
Algae  \[ ErC_{50} (96 \text{ h}) 0.00263 \text{mg/L} \]
Honeybee  Not available \( (LD_{50} \ (48 \text{ h}) > 100 \mu\text{g/bee}-- \text{pyroxasulfone}) \)
Earthworm  Not available \( (LC_{50} (14d) > 997 \text{mg/kg} -- \text{pyroxasulfone}) \)
Bird (bobwhite quail)  Not available \( (LD_{50} > 2,250 \text{mg/kg} -- \text{pyroxasulfone}) \)

12.2 Persistence and degradability

\[ DT_{50} \text{ soil} \]  16-28 days as pyroxasulfone
Biodegradability  Not available

12.3 Bioaccumulative potential
Not available \( (\log \text{Pow} 2.39-- \text{pyroxasulfone}) \)

12.4 Mobility in soil
Not available \( (\text{Absorption/desorption Koc} 1838 - 33617 --- \text{pyroxasulfone}) \)
12.5 Other adverse effects
   Not available

13. Disposal considerations
   Do not contaminate water, food, or feed by storage or disposal of this product. Empty bag may be
   disposed of in a sanitary landfill or by incineration, or, if allowed by state and authorities, by burning.
   If burned, stay out of smoke.
   Do not discharge effluent containing this product into lakes, streams, ponds, etuaries, oceans, or
   other waters unless in accordance with the requirements of a local regulation. Do not discharge
   effluent containing this product to sewer systems without previously notifying the local sewage
   treatment plant authority.

14. Transport information
14.1 UN number
   3077

14.2 UN proper shipping name
   ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Pyroxasulfone)

14.3 Transport hazard class(es)
   9

14.4 Packing group
   III

14.5 Environmental hazards
   Marine pollutant (P)

14.6 Special precautions for user
   Do not transport the product with food and/or feed.
   For the transportation, avoid elevated temperature and direct sunlight. Load the product without
   crushing, corroding of container and/or leaking from container. Prevent collapse of cargo.
   Do not load heavy goods on the top.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
   Not relevant

15. Regulatory information
   Not available

16. Other information
   The SDS summarized our best knowledge of the health and safety hazard information of the product
   and how to safely handle and use the product in the workplace. Each user should read this SDS and
   consider the information in the context of how the product will be handled and used in the workplace
   including in conjunction with other products.
   If clarification or further information is needed to ensure that an appropriate risk assessment can be
   made, the user should contact this company.
   Our responsibility for products sold is subject to our standard terms and conditions, a copy of which is
   sent to our customers and is also available on request.