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Guidance on the compilation of safety data sheet for chemical products

化学品安全技术说明书编写指南

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Guidance on the compilation of safety data sheet for chemical products

1 Scope

This standard specifies the detailed rules for the compilation of 16 parts of the SDS, the format of the SDS, the writing requirements of the SDS, the requirements for measurement units.

This standard applies to the compilation of SDS.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB 3100~3102 Quantities and units

GB 4839 Chinese common name for pesticides

GB/T 11651 Code of practice for selection of personal protective equipments

GB 12268 List of dangerous goods

GB 15258 General rules for preparation of precautionary label for chemicals

GB/T 16483 Safety data sheet for chemical products - Content and order of sections

GB/T 18664 Selection, use and maintenance of respiratory protective equipment

GB 20576 Safety rules for classification, precautionary labelling and precautionary statements of chemicals - Explosives

GB 20577 Safety rules for classification、precautionary labelling and precautionary statements of chemicals - Flammable gases

GB 20578 Safety rules for classification, precautionary labelling and precautionary statements of chemicals - Flammable aerosols

emergency telephone number for chemical accidents in the territory of China.

3.1.4 Recommended uses and restricted uses of chemicals

The filling of this item include:

a) Provide the recommended or expected use of the chemical, including a brief description of its practical application, such as the use as a flame retardant, as an antioxidant, etc.

b) It shall, as far as possible, explain the restrictions on the use of chemicals, including those recommended by non-statutory suppliers.

3.2 Overview of hazards

3.2.1 Overview of emergencies

The overview of emergency situation describes the serious hazards, that may be caused immediately by chemicals in the accident state, as well as the hazards that may have serious consequences, that need to be identified urgently; provide a reference for rescuers at the scene of a chemical accident. The matters needing attention in writing this item are as follows:

a) This item shall be placed in the starting position of the SDS Part 2 - Hazard summary, which may use eye-catching fonts or borders.

b) If necessary, describe the physical state of the chemical, such as color, shape, smell, vapor color.

c) For the following properties (but not limited to) of chemicals, they can be included in this item as hazards, that may cause immediate serious hazards or have serious consequences, that need to be identified urgently in an accident state:

1) Chemicals are flammable and explosive;

2) The chemical has a major or special fire or explosion hazard (such as can spread to the ignition source, can form an explosive mixture, combustible dust explosion hazard, etc.);

3) Belong to oxidant, organic peroxide, spontaneous combustion substance;

4) The chemical is unstable (reaction) or reacts with water;

5) It can cause major reactive hazards (for example, uncontrolled reaction with water or organic matter, natural decomposition, etc.);

Signal word: Danger.

Hazard statement: Extremely flammable liquid and vapor; fatal if swallowed; very toxic to aquatic organisms.

Precautionary statement:

Precaution:

- Keep away from heat, sparks, open flames, hot surfaces. Use tools, that do not produce sparks, to perform operation.

- Keep the container tightly closed.

- Take measures to prevent static electricity; ground and connect the container and receiving equipment.

- Use explosion-proof electrical appliances, ventilation, lighting, other equipment.

- Wear protective gloves, protective goggles, protective face shields.

- Thoroughly wash body parts, that are exposed, after operation.

- No eating, drinking, or smoking in the workplace.

- Discharge into the environment is prohibited.

Incident response:

- Skin (or hair) contact: Take off all contaminated clothing immediately; use water to rinse the skin AND take a shower.

- Ingestion: Induce vomiting, seek medical attention immediately.

- Collect leakage.

- In case of fire, use dry powder, foam, carbon dioxide to extinguish the fire.

Safe storage:

- Store in a cool, well-ventilated place.

- Locked for safekeeping.

Disposal:

- This product or its container is disposed of by incineration.

3.2.4 Physical and chemical hazards

Inhalation: Can be quickly absorbed through the lungs. Can cause liver and kidney damage. Excessive inhalation can cause depression of central nervous system, drowsiness, disturbance of consciousness. Cause arrhythmia.

Ingestion: Non-toxic if swallowed.

Chronic effects: Long-term or repeated excessive exposure can cause liver and kidney damage. Animal studies have shown carcinogenicity. IARC lists it as a possible carcinogen (G2A). No significant reproductive toxicity is found in the rat test.

Skin: Prolonged contact can cause skin irritation. One time or long-term contact has not cause skin absorption of harmful doses of this product.

Eyes: May cause mild irritation.

Symptoms and signs: Redness and swelling after eye and skin irritation; drowsiness or disturbance of consciousness; arrhythmia; changes in urine output and urine appearance after renal damage, edema (accumulation of body fluids); loss of appetite and jaundice (skin becomes yellow) after liver damage, occasionally with upper abdominal pain.

3.2.6 Environmental hazards

The matters, that shall be paid attention to, when writing this item are:

a) Describe the significant environmental hazards of chemicals, in a simple and easy-to-understand language. Relevant supporting information or data can be provided in SDS Part 12 - Ecological information.

b) The specific ingredients in the mixture, that can cause environmental hazards, can be described in this item or in SDS Part 12.

c) If the information shows that the chemical has no significant environmental impact, it can be stated in this item or in SDS Part 12.

Example 1:

Toxic to aquatic life. May cause long-term harmful effects on the aquatic environment.

Example 2:

No significant toxic effects were found in the algae test.

3.2.7 Other hazards

This item shall describe other hazard characteristics, that are not included in

3.4.1 Description of first aid measures

The matters, that shall be paid attention to, when writing this item are:

a) According to the different exposure routes of the chemical, in the order of inhalation, skin contact, eye contact, ingestion, respectively describe the corresponding first-aid measures. If there are other injuries (such as frostbite caused by cryogenic liquids, burns caused by solid melting, etc.) that must be treated, in addition to poisoning and chemical burns, it shall also explain the corresponding first-aid measures.

Example:

First aid:

Inhalation: Leave the scene quickly, to a place with fresh air. Keep the airway unobstructed. If breathing is difficult, supply oxygen. In case of breathing and heartbeat stop, immediately perform cardiopulmonary resuscitation. Seek medical attention immediately.

Skin contact: Take off contaminated clothing immediately. Use plenty of running water to rinse it thoroughly, for at least 15 minutes. Seek medical attention immediately.

Eye contact: Immediately separate the eyelids. Use running water or saline to rinse it thoroughly. The rinsing time is generally 5 min ~ 10 min. Seek medical attention immediately.

Ingestion: Rinse mouth, do not induce vomiting. Seek medical attention immediately.

b) The proposed first aid measures shall correspond to the health hazard items in the SDS Part 2.

c) The proposed first aid measures shall be consistent with the first aid measures, that are described on the label.

d) First aid measures should be evaluated and determined, one by one, by medical professionals, according to the health hazard characteristics of chemicals.

e) Suggestions shall be made on the following matters (but not limited to):

1) Whether the contacts shall be moved from the scene to a place with fresh air;

2) Whether it is necessary to remove the clothing of contacts AND dispose of contaminated clothing;

a) Applicable extinguishing agents: Use concise language to indicate the applicable extinguishing agents. For the selection of suitable fire extinguishing agents, please refer to relevant professional books. For the selection of suitable fire extinguishing agents for certain chemical fires, please refer to GB 17914, GB 17915, GB 17916.

Example 1:

Use foam, CO_2 or dry powder to extinguish the fire.

b) Inapplicable extinguishing agents: Indicate the unsuitable extinguishing agents, including those that may have chemical reactions or rapid physical changes with the igniting substances, which will cause other hazards (such as certain substances that react with water to release flammable or toxic gases). It is recommended to fill in the reason why the fire extinguishing agent is not applicable.

Example 2:

Extinguishing with water is invalid.

Example 3:

Avoid using direct running water to extinguish fires. Direct running water may cause flammable liquids to splash and spread the fire.

3.5.2 Special hazards

This item shall provide information on the special hazards, that may be caused by chemicals in the fire scene, e.g.:

a) Poisonous and harmful combustion products, that may be produced by chemical combustion.

b) When the compressed gas (or liquid) in the container is exposed to high heat, it expands rapidly, OR the material polymerizes and releases heat, which causes the internal pressure of the container to increase, thereby leading to cracking or explosion.

Example:

Special hazards: Combustion produces toxic sulfur or nitrogen oxide gases.

3.5.3 Precautions and protective measures for fire extinguishing

The information provided in this item shall include:

a) Protective actions taken during the fire extinguishing process. For

example, isolate the accident site, prohibit unrelated personnel from entering; firefighters shall put out the fire in the upwind direction; spray water to cool the container, etc.

b) Personal protective equipment to be worn by firefighters. Including fire-fighting boots, fire-fighting clothing, fire-fighting gloves, fire-fighting helmets, respiratory protective equipment (such as self-contained breathing apparatus).

c) When filling in this item, it shall include the information about the possibility of leakage AND firefighting water pollution to water sources and soil, as well as the measures to be taken, to reduce such environmental pollution.

3.6 Leakage emergency treatment

3.6.1 Personal protective measures, protective equipment and emergency procedures

It includes:

a) Protective equipment worn by non-emergency personnel (see SDS Part 8).

b) Protective equipment worn by emergency personnel.

c) Fire source control measures.

d) Delineation of the on-site guard zone and evacuation of personnel.

e) Leak source control measures.

f) Control of leakage, etc.

Example:

Personal protective measures, protective equipment and emergency procedures:

Eliminate all ignition sources;

Delimit the warning zone, according to the influence area of liquid flow and vapor diffusion; evacuate irrelevant personnel to the safe zone;

It is recommended that emergency personnel wear positive pressure self-contained breathing apparatus, anti-static clothing, rubber and oil-resistant gloves;

All equipment used during operation shall be grounded;

3.7.1 Handling

The filling contents of this item include:

a) Make suggestions on precautions and measures, for the safe disposal of chemicals, which include:

1) Prevent personnel from coming into contact with chemicals: It shall fill other precautions and measures, to prevent personnel from coming in contact with the contents, than those required in the SDS Part 8 - Exposure control/personal protection requirements. For the personal protection and other measures, it may be indicated in this item that "Refer to SDS Part 8".

2) Fire and explosion prevention: It shall fill the precautions and measures, for preventing fire, explosion, etc.

3) Local or comprehensive ventilation: Fill in the necessity of using local or comprehensive ventilation measures, when handling chemicals.

4) Prevent the generation of aerosol and dust: Fill in the precautions and measures to prevent the generation of aerosol and dust, when handling chemicals.

5) Prevent contact with incompatible materials (incompatible substances or mixtures): Fill in special handling precautions to prevent direct contact with incompatible materials.

b) Recommendations for general hygiene requirements, e.g.:

1) It is forbidden to eat or drink in the workplace;

2) Wash hands after use;

3) Take off contaminated clothing and protective equipment, before entering the dining area.

Example:

Handling:

Airtight operation, to prevent vapor from leaking into the workplace atmosphere;

Avoid contact with eyes and skin; avoid inhalation of vapors; see Part 8 for personal protective measures;

Handling shall be carried out in a place, which has local ventilation or comprehensive ventilation facilities;

Example:

Storage:

Store in a cool, well-ventilated dedicated warehouse;

Usually added with stabilizers;

Keep away from fire and heat sources;

The storage temperature shall not exceed 37 °C;

It shall be stored separately from oxidants, acids, alkalis; avoid mixed storage;

Use explosion-proof lighting and ventilation facilities;

It is forbidden to use mechanical equipment and tools, that are prone to sparks;

The storage area shall be equipped with leakage emergency treatment equipment and suitable storage materials.

3.8 Exposure control and personal protection

3.8.1 Occupational exposure limits

List the occupational exposure limits of the substance or mixture components. The following points shall be noted when writing this item:

a) Accurately fill in the allowable concentration of chemical substances in the air in the workplace of GBZ 2.1, including the maximum allowable concentration (MAC), permissible concentration-time weighted average (PC-TWA), permissible concentration-short-term exposure limit (PC-STEL).

b) For substances for which occupational exposure limit values have not been established in China, it may fill the occupational exposure limits of the substances, which are stipulated by developed countries abroad. For example, the threshold limit value (TLV) of the American Conference of Governmental Industrial Hygienists (ACGIH), including threshold limit-time weighted average concentration (TLV-TWA), threshold limit-short-term exposure limit (TLV-STEL), threshold limit-ceiling (TLV-C).

c) If other air pollutants are expected to be produced, during the use of chemicals, it shall list the occupational exposure limits for these pollutants.

d) When filling in the occupational exposure limit value, care shall be taken not to omit the label content, to maintain the integrity of the occupational exposure limit value. For example, the following signs used in GBZ 2.1:

a) For the recommended use of chemicals, which are described in SDS Part 1 - Identification of chemicals and corporate, it shall list the engineering control methods to reduce exposure.

b) The proposed engineering control measures shall comply with relevant national standards, such as: GBZ 1, GBZ/T 194, etc.

c) Indicate the circumstances, under which special engineering control measures need to be taken, meanwhile state the types of engineering control measures, e.g.:

1) Use a local exhaust system, to keep the concentration in the air below the occupational exposure limit;

2) Use only in closed systems;

3) Use only in the spray booth;

4) Use mechanical operations, to reduce the contact between personnel and materials;

5) Adopt dust explosion control measures.

d) This item is a further supplement to SDS Part 7.

3.8.5 Personal protective equipment

The use of personal protective equipment shall be combined with other control measures (including ventilation, containment and isolation, etc.), to minimize the possibility of illness and injury, which are caused by chemical exposure. This item shall provide suggestions for the correct selection and use of personal protective equipment. The main points of writing are as follows:

a) The selection of personal protective equipment, shall comply with relevant national or industry standards, including: GB/T 11651, GB/T 18664, GBZ/T 195, etc.

b) According to the hazardous characteristics of the chemical and the possibility of exposure, propose the recommended personal protective equipment, including:

1) Respiratory protection: According to the form of the chemical (gas, vapor, mist or dust), hazardous characteristics, the possibility of exposure, fill in the appropriate type of respiratory protective equipment, such as filter respirators and appropriate filter elements (filter cartridges or filter canisters);

2) Eye and face protection: According to the possibility of eye and face

1) Radioactivity;

2) Bulk density;

3) Calorific value;

4) Volatile organic compound (VOC) content;

5) Softening point;

6) Viscosity;

7) Percentage of volatilization;

8) Saturated vapor concentration (including temperature);

9) Sublimation point;

10) Liquid conductivity;

11) Metal corrosion rate;

12) Dust particle size/dust dispersion;

13) Minimum ignition energy (MIE);

14) Minimum explosive concentration (MEC).

If the items listed above are not applicable or have no information, they do not need to be included in the SDS.

e) When necessary, it shall provide the data measurement method and relevant conditions. For example: Flash point: 23 °C (closed cup); Kinematic viscosity: 0.65 mm^2/s (25 °C).

3.10 Stability and reactivity

3.10.1 Stability

Describe whether the substance or mixture is stable, under normal conditions and expected storage and disposal temperature and pressure conditions. Describe any stabilizers, that may need to be used, to maintain the chemical stability of the substance or mixture. Describe the safety significance of changes in the appearance of the substance or mixture.

3.10.2 Hazardous reaction

Explain whether the substance or mixture can undergo hazardous reactions, which are accompanied by phenomena such as pressure increase,

Stability: This product is stable when stored and used under normal ambient temperature.

Hazardous reaction: Contact with water or substances that can react with this product, or the temperature exceeds 177 °C, may cause polymerization. The polymerization process produces a large amount of carbon dioxide and heat. Heat accumulation and pressure increase may cause the sealed container to rupture.

Conditions to avoid: Humid air, high heat, direct sunlight.

Incompatible materials: Water, amines, strong alkalis, alcohols and copper alloys, etc.

Hazardous decomposition products: Hydrogen cyanide, isocyanate, isocyanic acid, other unknown compounds will be produced when exposed to high heat.

3.11 Toxicological information

Matters to which attention shall be paid, when writing this part, include:

a) The information provided shall be used to assess the health hazards of substances and mixtures AND to classify their hazards. This information includes:

   1) Data on human health hazards (e.g., epidemiological studies, case reports or human skin patch tests, etc.);

   2) Animal test data (e.g., acute toxicity test, repeated toxicity test, etc.);

   3) In vitro test data (e.g., in vitro mammalian cell chromosome aberration test, Ames test, etc.);

   4) Structure-activity relationship (SAR) [such as quantitative structure-activity relationship (QSAR)].

b) Provide supporting toxicological information for the classification of health hazards in SDS Part 2 - Hazard overview.

c) For animal test data, it shall fill in concisely, the type of test animal (sex), route of exposure (oral, transdermal, inhalation, etc.), frequency, time, dose. For the poisoning case report and epidemiological investigation information, they shall be described separately.

d) It shall provide information on toxic effects (health effects), which are caused by contact with the substance or mixture, according to different routes of exposure (e.g., inhalation, skin contact, eye contact, ingestion).

example, according to the route of exposure.

m) For the description of the toxic effects (health effects) of the mixture, it shall pay attention to the following issues:

1) For a specific toxic effect, if there is overall test (observation) data for the mixture, the overall data shall be filled in; if there is no overall test (observation) data for the mixture, it shall fill in the relevant data of the component in SDS Part 3 - Ingredients/composition information.

2) The various components may interact in the body, causing changes in their absorption, metabolism, excretion rates. Therefore, the toxic effects may change; the total toxicity of the mixture may be different from the toxicity of its components. It shall be considered when filling in.

3) It shall be considered whether the concentration of each component is sufficient to affect the total toxicity (health effect) of the mixture. It shall list the information on the toxic effects (health effects) of the relevant components, except in the following cases:

- If the same toxic effects (health effects) exist between the components, it is not necessary to repeat them. For example, in the case that both components can cause vomiting and diarrhea, it is not necessary to list these symptoms twice; it is enough to describe the mixture as being capable of causing vomiting and diarrhea.

- The existence concentration of the component is unlikely to cause related effects. For example, if a mild irritant is diluted to a certain concentration, by a non-irritating solution, THEN, the overall mixture will not be able to cause irritation.

- The interaction between the components is difficult to predict. Therefore, when the interaction information is not available, it cannot be assumed arbitrarily. Instead, it shall describe the toxic effects (health effects) of each component, separately.

n) For other health hazards, even if GHS does not make classification requirements, relevant information shall be provided in this Part of the SDS.

3.12 Ecological information

Matters to which attention shall be paid, when writing this part, include:

a) It shall provide the supporting information for the environmental hazard classification in SDS Part 2 - Hazard overview.

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Accountable person and shareholder: Wayne Zheng

About Us (Goodwill, Policies, Fair Trading…): https://www.chinesestandard.net/AboutUs.aspx

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: https://www.linkedin.com/in/waynezhengwenrui/

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