**How to Prepare a Safety Data Sheet (SDS) for a Synthesized Chemical**

If synthesizing a hazardous chemical, the PI or manager must generate a Globally Harmonized System (GHS) compliant label and SDS before shipping or transporting the chemical away from the campus. Use the SDS template to make a GHS compliant SDS. Don’t forget to add these chemicals to MyChem and attach your SDS.

The SDS includes information such as the properties of each chemical; the physical, health, and environmental hazards; protective measures; and safety precautions for handling, storing, and transporting the chemical. The person preparing the SDS must ensure the information accurately reflects the scientific evidence used in making the hazard determination.

For solutions or mixtures of chemicals it is best practice to list 100% of the ingredients, regardless if they are hazardous or not. It is required to list:

* All hazardous components that constitute greater than 1% of the chemical
* All carcinogens that constitute greater than 0.1% of the chemical

The attached SDS template is based on the Oregon State Department of Labor & Industries hazard communication standard [OAR 1910.1200 Appendix D-Safety data sheets,](https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1200AppD) and can be used to prepare an SDS for synthesized chemicals. The SDS must include the information specified in Appendix D, Table D.1, under the section number and items indicated in the attached (in *red italics*) for sections 1-11 and 16. If no relevant information is found for any given item within a section, the SDS must clearly indicate that no applicable information is available. Sections 12-15 may be included in the SDS, but are not mandatory.

When SDS is completed delete the instructions in *red italics*.

In addition to the SDS, chemical containers must be labeled according to [OAR 1910.1200 Appendix C-Allocation of label elements](https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1200AppC" \t "_blank)

Contact EHS at [ehs-group@pdx.edu](mailto:ehs-group@pdx.edu) or 503-725-4312 for assistance or questions in preparing a Safety Data Sheet.

**References:**

[OAR 437, DIVISION 2 Subdivision Z Hazard Communication](https://osha.oregon.gov/OSHARules/div2/div2Z-1200-haz-com.pdf)

[OAR 1910.1200 Appendix C-Allocation of label elements](https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1200AppC)

OAR 1910.1200 Appendix D-Safety data sheets

OSHA document: [Hazard Communication, Classification Guidance for Manufacturers, Importers, and Employers](https://www.osha.gov/Publications/OSHA3844.pdf)

SAFETY DATA SHEET

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| **Section 1: Identification** | | | | | | | |
| *(a) Product identifier used on the label*  *(b) Other means of identification*  *(c) Recommended use of the chemical and restrictions on use*  *(d) Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party*  *(e) Emergency phone number*  **Product Name:**  **Chemical Name/Synonyms:**  **Company: Portland State University, Department:**  **In emergency call 911.**  **For information about this SDS, use this department contact phone#:** | | | | | | | |
| **Section 2: Hazard(s) Identification** | | | | | | | |
| **See** [**https://www.sigmaaldrich.com/safety-center/globally-harmonized.html**](https://www.sigmaaldrich.com/safety-center/globally-harmonized.html) **for a list of hazard classifications, signal words, hazard statements, pictograms, precautionary statements, and a description of hazards.**  *(a) Classification of the chemical in accordance with OAR 437 Division 2, 1910.1200*  *(b) Signal word(s), hazard statement(s); symbol(s) and precautionary statement(s). in accordance with ORS 453.035 (Hazard symbols may be provided as graphical reproductions in black and white or the name of the symbol, e.g., flame, skull and crossbones)*  *(c) Describe any hazards not otherwise classified that have been identified during the classification process*  *(d) Where an ingredient with unknown acute toxicity is used in a mixture at a concentration ≥ 1% and the mixture is not classified based on testing of the mixture as a whole, a statement that X% of the mixture consists of ingredient(s) of unknown acute toxicity is required*  **Hazard Classification:**  **Signal Word(s):**  **Hazard Statements:**  **Pictograms:**       **Delete pictograms that don’t apply!**  FlameGas cylinderExploding bombcorrosionSkullexclamation-markFlame over circleHealth hazardEnvironment  **Precautionary Statements:**  **Description of other hazards:** | | | | | | | |
| **Section 3: Composition/ Information on Ingredients** | | | | | | | |
| *Except as provided for in OAR 837-085-0170(1) and (2) on trade secrets:*  *For Substances*  *(a) Chemical name*  *(b) Common name and synonyms*  *(c) CAS number and other unique identifiers*  *(d) Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance*  *For Mixtures*  *In addition to the information required for substances:*  *(a) The chemical name and concentration (exact percentage) or*  *concentration ranges of all ingredients which are classified as health hazards in accordance with OAR 837-090-1020 and*  *(1) are present above their cut-off/concentration limits; or*  *(2) present a health risk below the cut-off/concentration limits.*  *(b) The concentration (exact percentage) must be specified unless a trade secret claim is made in accordance with in OAR 837-085-0170(1) and (2) on trade secrets, when there is batch-to-batch variability in the production of a mixture, or for a group of substantially similar mixtures (See OAR 437-004-9800 (A* *1910.1200)) with similar chemical composition. In these cases, concentration ranges may be used.*  *For All Chemicals Where a Trade Secret is Claimed*  *Where a trade secret is claimed in accordance with in OAR 837-085-0170(1) and (2) on trade secrets, a statement that the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret is required*. | | | | | | | |
| **Chemical Name** | | **Synonym** | | | **CAS#** | | **Conc.** |
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| **Section 4: First-Aid Measures** | | | | | | | |
| *(a) Description of necessary measures, subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion*  *(b) Most important symptoms/effects, acute and delayed*  *(c) Indication of immediate medical attention and special treatment needed, if necessary*  **After skin contact:**  **After eye contact:**  **After inhalation:**  **After swallowing**: | | | | | | | |
| **Section 5: Fire-Fighting Measures** | | | | | | | |
| *(a) Suitable (and unsuitable) extinguishing media*  *(b) Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products)*  *(c) Special protective equipment and precautions for fire-fighters*  **Suitable extinguishing agents:**        **Special protective equipment for firefighters:** | | | | | | | |
| **Section 6: Accidental Release Measures** | | | | | | | |
| *(a) Personal precautions, protective equipment, and emergency procedures*  *(b) Methods and materials for containment and cleaning up*  **Personal precautions:**  **Measures for environmental protection:**  **Measures for cleaning/collecting:** | | | | | | | |
| **Section 7: Handling and Storage** | | | | | | | |
| *(a) Precautions for safe handling*  *(b) Conditions for safe storage, including any incompatibilities*  **Handling:**  **Storage:** | | | | | | | |
| **Section 8: Exposure Controls/Personal Protection** | | | | | | | |
| *(a) DOSH permissible exposure limit (PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available*  *(b) Appropriate engineering controls*  *(c) Individual protection measures, such as personal protective equipment* | | | | | | | |
| **Chemical Name** | **OSHA PEL** | | **OSHA PEL (ceiling)** | **ACGIH OEL (TWA)** | | **ACGIH OEL (STEL)** | |
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| **General protective and hygienic measures:**  **Breathing equipment:**  **Protection of hands:**  **Eye protection:** | | | | | | | |
| **Section 9: Physical and Chemical Properties** | | | | | | | |
| (*a) Appearance (physical state, color, etc.)*  *(b) Odor*  *(c) Odor threshold*  *(d) pH*  *(e) Melting point/freezing point*  *(f) Initial boiling point and boiling range*  *(g) Flash point*  *(h) Evaporation rate*  *(i) Flammability (solid, gas)*  *(j) Upper/lower flammability or explosive limits*  *(k) Vapor pressure*  *(l) Vapor density*  *(m) Relative density*  *(n) Solubility(ies)*  *(o) Partition coefficient: n-octanol/water*  *(p) Auto-ignition temperature*  *(q) Decomposition temperature*  *(r) Viscosity*  **Form:**  **Odor:**  **Odor threshold:**  **pH:**  **Melting point/melting range:**  **Boiling point/boiling range:**  **Flash point:**  **Evaporation rate:**  **Flammability:**  **Upper/lower flammability or explosive limits:**  **Auto ignition temperature:**  **Danger of explosion:**  **Vapor pressure:**  **Vapor density:**  **Relative density:**  **Solubility in/Miscibility with water:** | | | | | | | |
| **Section 10: Stability and Reactivity** | | | | | | | |
| *(a) Reactivity*  *(b) Chemical stability*  *(c) Possibility of hazardous reactions*  *(d) Conditions to avoid (e.g., static discharge, shock, or vibration)*  *(e) Incompatible materials*  *(f) Hazardous decomposition products*  **Reactivity:**  **Chemical stability**:  **Conditions to avoid:**  **Incompatible materials:**  **Hazardous decomposition products:** | | | | | | | |
| **Section 11: Toxicological Information** | | | | | | | |
| *Description of the various toxicological (health) effects and the available data used to identify those effects, including:*  *(a) Information on the likely routes of exposure (inhalation, ingestion,*  *skin and eye contact)*  *(b) Symptoms related to the physical, chemical and toxicological*  *Characteristics*  *(c) Delayed and immediate effects and also chronic effects from short and long-term exposure*  *(d) Numerical measures of toxicity (such as acute toxicity estimates)*  *(e) Whether the hazardous chemical is listed in the National*  *Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition), or by*  *DOSH*  **Acute toxicity:**  **Potential routes of exposure/potential health effects**  **Skin:**  **Eye:**  **Inhalation:**  **Ingestion:**  **Carcinogenic effects:**  **Mutagenic effects:**  **Reproductive toxicity:**  **Sensitization:**  **Target organs:** | | | | | | | |
| **Section 12: Ecological Information (non-mandatory)** | | | | | | | |
| *(a) Ecotoxicity (aquatic and terrestrial, where available)*  *(b) Persistence and degradability*  *(c) Bioaccumulative potential*  *(d) Mobility in soil*  *(e) Other adverse effects (such as hazardous to the ozone layer)*  **Ecotoxicity:**  **Mobility:**  **Biodegradation:**  **Bioaccumulation:** | | | | | | | |
| **Section 13: Disposal Considerations (non-mandatory)** | | | | | | | |
| *Description of waste residues and information on their safe handling*  *and methods of disposal, including the disposal of any contaminated*  *packaging* | | | | | | | |
| **Section 14: Transport Information (non-mandatory)** | | | | | | | |
| *(a) UN number*  *(b) UN proper shipping name*  *(c) Transport hazard class(es)*  *(d) Packing group, if applicable*  *(e) Environmental hazards (e.g., Marine pollutant (Yes/No));*  *(f) Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code)*  *(g) Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises*  **DOT regulations:**   * **Hazard class:** * **Land transport ADR/RID (cross-border):** * **ADR/RID class:** * **Maritime transport IMDG:**   **Air transport ICAO-TI and IATA-DGR:**   * **ICAO/IATA Class:** | | | | | | | |
| **Section 15: Regulatory Information (non-mandatory)** | | | | | | | |
| *Safety, health and environmental regulations specific for the product in question*  **US Federal Regulations**  **SARA Section 355 (extremely hazardous substances):**  **SARA Section 313 (specific toxic chemical listings):**  **Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs):**  **TSCA (Toxic Substances Control Act):** | | | | | | | |
| **Section 16: Other Information** | | | | | | | |
| *The date of preparation of the SDS or the last change to it*  **SDS date of preparation/update:** | | | | | | | |