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Naming Standards for Environmental Management of Chemical Substances

Technical specification for nomenclature of chemical substances for Environmental Management

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Table of Contents

Preface

This standard is formulated to implement the Environmental Protection Law of the People's Republic of China and other laws and regulations, standardize the naming of chemical substances in environmental management, support the environmental management registration of new chemical substances, the management of the Inventory of Existing Chemical Substances in China, and the environmental risk assessment and control of chemical substances.

This standard specifies the naming requirements for chemical substances in the field of environmental management.

Appendix A of this standard is an informative appendix. This standard is published for the first time. This standard was formulated by the Solid Waste and Chemicals Department and the Regulations and Standards Department of the Ministry of Ecology and Environment. The main drafting units of this standard are: Solid Waste and Chemicals Management Technology Center of the Ministry of Ecology and Environment, Nanjing Environmental Science Research Institute of the Ministry of Ecology and Environment Institute, Chinese Academy of Environmental Sciences, Jiangsu Academy of Environmental Sciences. This standard was approved by the Ministry of Ecology and Environment on March 21, 2024. This standard will be implemented on July 1, 2024. This standard is interpreted by the Ministry of Ecology and Environment.

Naming Standards for Environmental Management of Chemical Substances

1 Scope of application

This standard specifies the naming requirements for chemical substances in the field of environmental management. This standard is applicable to the environmental management registration of new chemical substances, the management of the "Inventory of Existing Chemical Substances in China", and the environmental risk assessment of chemical substances. The naming of chemical substances in environmental management work such as control and prevention.

2 Normative references

This standard refers to the following documents or clauses therein. For any dated referenced document, only the dated version applies to this standard. For any undated referenced document, the latest version (including all amendments) applies to this standard.

GB/T 23955 General Rules for Nomenclature of Chemicals

HJ/T 420 Guidelines for the Compilation of Notification Classification Names for New Chemical Substances (Inventory of Existing Chemical Substances in China)

3 Terms and definitions

The following terms and definitions apply to this standard.

3.1

Chemical substances are single substances and compounds taken from nature or produced through processing, excluding mixtures formed by physical mixing of chemical substances.

3.2

New chemical substances are chemical substances not included in the "Inventory of Existing Chemical Substances in China".

3.3

A constituent is a single entity present in a chemical substance that has unique chemical properties.

3.4

Impurity is an undesirable component present in the final product that does not contribute to the product function and may come from raw materials, side reactions in the production process or If the reaction is incomplete, the mass fraction of a single component does not exceed 10%, and the mass fraction of the total amount of components does not exceed 20%.

3.5

Main constituent The components of a chemical substance other than impurities.

3.6

Mono-constituent substance A chemical substance that has one main component with a mass fraction greater than or equal to 80% and other components are impurities.

3.7

Multi-constituent substance A chemical substance that has two or

more main components, each with a mass fraction of less than 80%.

Or there is a main component with a mass fraction greater than or equal to 80%, as well as other main component chemical substances.

3.8

Polymer: A substance

composed of one or more monomer units in sequence. The molecular weight of such molecules is distributed within a certain range.

The difference mainly depends on the number of monomer units. A polymer should meet the following three

conditions at the same time: (1) The molecular weight is not a fixed value, but

is dispersed; (2) More than 50% (by weight) of the molecules contain at least 3 monomer units, which are covalently bonded to the

(3) The molecules with the same molecular weight do not exceed

50% (by weight) of all molecules. A monomer is a chemical that can form covalent bonds with two

or more identical or different molecules under certain polymerization conditions.

Science material;

A monomer unit refers to the form of a monomer in a polymer after reaction;

a sequence refers to the form of a continuous monomer connected by covalent bonds in a molecule, and its units are not interrupted by units other than monomer units; a

reactant refers to a molecule connected to one or more monomer unit sequences, which cannot become a part of the polymer structure under specific reaction conditions.

Repeating unit of

Weight percentage refers to the weight ratio of the monomers or reactants involved in the polymerization reaction, or the weight ratio of the monomers or reactants combined in the molecule after the polymerization reaction is completed.

The weight ratio of the monomer units or reactants.

3.9

substances of Unknown or Variable composition, Complex reaction products

UVCB substances of unknown or variable

composition, complex reaction products or biological materials;

4 Naming requirements

4.1 Basic requirements

4.1.1 The names of chemical substances shall be accurate, standardized and reasonable to achieve the purpose of identifying and distinguishing chemical substances. 4.1.2 The Chinese name shall conform to the Chinese word formation habits. 4.1.3 For applications for environmental management registration of new chemical substances and requesting the protection of chemical substance name information, the new chemical substance class name shall be compiled in accordance with the requirements of HJ/T 420. 4.1.4 Minerals may use common mineralogical names, such as kaolin minerals, bentonite minerals, montmorillonite minerals, etc. 4.1.5 Names obtained according to other naming principles other than this standard, as well as trade names, common names, abbreviations, common names, etc., may be used as other names in environmental management work.

4.2 Selection of naming methods for chemical substances

4.2.1 Chemical substances are divided into defined chemical substances and undefined chemical substances. Defined chemical substances can be divided into single-component substances and multi-component substances, and undefined chemical substances include polymers and unknown complex substances. 4.2.2 Different categories of chemical substances are named in different ways. The naming method selection process is shown in Figure 1.

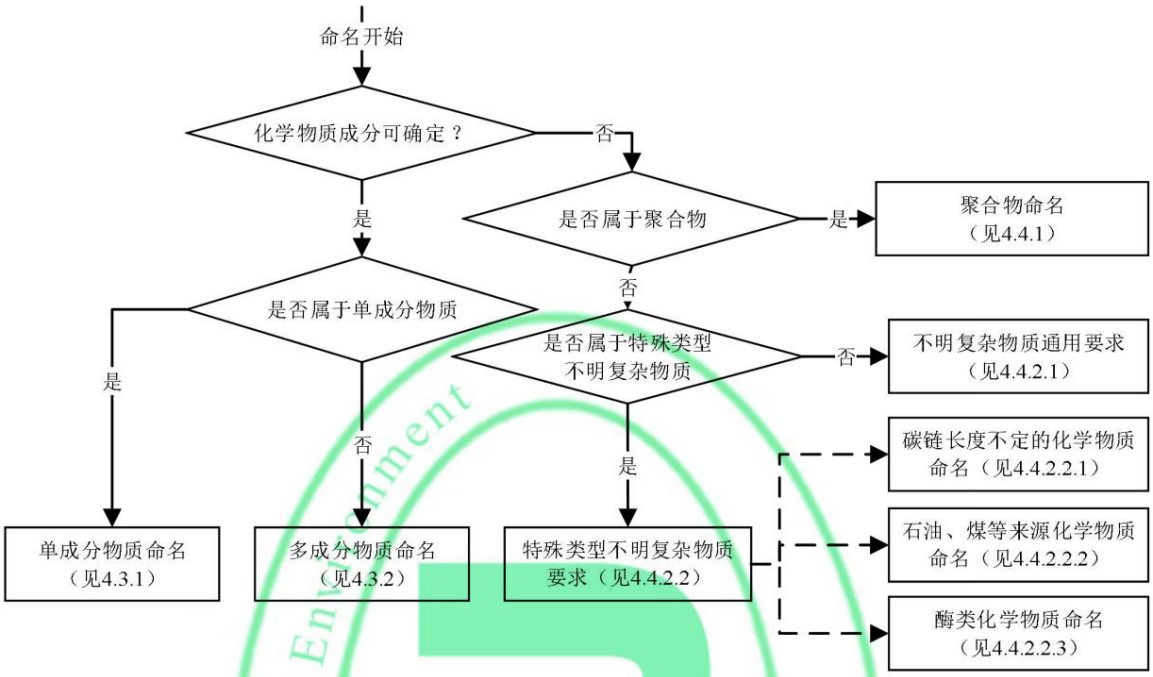

Figure 1 Flowchart for selecting naming methods for different categories of chemical substances

4.3 Determine the name of the chemical substance

4.3.1 Naming of single-component substances

For single-component substances, the name of the main component is used as the name of the chemical substance. The name of the main component should comply with the "Inorganic Chemistry" of the Chinese Chemical Society. Principles of Nomenclature" "Principles of Nomenclature of Organic Compounds".

4.3.2 Naming of multi-component substances

The general format for naming multi-component substances is: reaction product containing [name of main component A; name of main component B; ...]. All main components should be listed when naming. The naming of each main component shall refer to the naming requirements of the main component names in 4.3.1 of this standard, and shall be arranged in order from high to low mass fraction. For those with the same mass fraction, they shall be arranged in order from small to large according to the first different pinyin, letter or number of their Chinese names.

4.4 Naming of Chemical Substances with Uncertain Composition

4.4.1 Polymer Nomenclature

The name of the polymer should comply with the "Principles of Polymer Chemistry Nomenclature" of the National Committee for the Examination of Scientific and Technological Terms. include:

a) Source-based nomenclature based on the monomers involved in the polymerization reaction. The general format is to add the word "poly" before the polymerization reaction monomer, or to express it as a polymer of polymerization reaction monomers and other reactants. Polymerization reaction monomers are usually sorted from high to low according to mass fraction. The names of all polymerization reaction monomers, initiators, end-capping agents and other reactants with a weight percentage greater than 2% should be listed in the polymer name. For example, the polymerization reaction monomers (weight percentage) are M1 (35%), M2 (28%), M3 (15%), M4 (12%), M5 (5%), M6 (1.5%); the initiator or end-capping agent of the polymerization reaction (weight percentage) is R1

(2.2%), R2 (1.3%). The polymer names are: M1 and M2, M3, M4 and M5 initiated or terminated by R1.

b) Structure-based nomenclature based on the repeating structural units that make up the polymer backbone. Polymers with a defined structure are named using the structure-based nomenclature, and the general format is to prefix the word "poly" before the repeating structural unit.

4.4.2 Nomenclature of Unknown Complex Substances (UVCB)

4.4.2.1 General requirements

UVCB is usually named by combining the source and processing method, and is arranged in the order of source and processing method. a) The sources of UVCB include chemical sources, biological sources, mineral sources, etc.

1) Chemical sources are indicated by the name of the starting raw material of the chemical reaction. 2) Biological sources are indicated by the species name, which can be the name of the genus, species or family, such as Swiss pine, the genus is Pinus, the species is Swiss pine, and the family is Pinaceae. When applicable, the names of the species' tissues, organs, etc. can be supplemented, such as the bone marrow and pancreas of animals, and the roots, stems, leaves, etc. of plants. 3) Mineral sources can be indicated by the common mineralogy name, such as phosphate rock, bauxite, porcelain clay, etc.

b) Processing methods include the following situations:

1) The processing method is synthetic, which is indicated by the reaction type, such as hydrolysis, esterification, alkylation or chlorination.

Yes, it is correct, but it does not need to be pointed out.

2) If the processing method is extraction, it should be indicated by the type of extraction, such as extraction, fractionation, concentration or distillation.

3) If there are multiple processing methods, each processing method should be clearly stated in the order of processing.

4.4.2.2 Special type requirements

4.4.2.2.1 Naming of Chemical Substances with Variable Carbon Chain Length

For substances with one or more long-chain alkyl groups with a functional group structure, the alkyl index, functional group index and salt index are used for naming. a) The alkyl index describes the carbon atom information in the alkyl carbon chain, including:

1) Number. Cx-y includes all chain lengths from *x* to *y* , such as C8-12 corresponds to C8, C9, C10, C11 and C12. Among them, if the number of carbon atoms in the carbon chain is even or odd, it should be clearly stated, such as C8-12 (even number). In addition, a wider carbon chain distribution cannot replace a narrower carbon chain distribution, and vice versa, such as C10-14 is not the same as C8-18. 2) Linearity. Such as C8-12 (branched chain) or C8-12 (straight chain and branched chain). 3) Saturation. Cx-y usually refers to saturated alkyl groups, and unsaturated alkyl groups should be clearly stated, such as C18-22 unsaturated fatty acids. 4) Source. Such as animal fats and oils. The distribution of carbon chain lengths should be consistent with the source. For example, the carbon chain length of long-chain substances derived from plants is usually

b) Functional group index describes the functional groups in chemical substances, such as carboxylic acid, aldehyde, ketone, etc. c) Salt index describes the cation or anion of any salt, such as sodium ion (Na +), carbonate ion (CO3 2-), chloride ion (Cl -), etc.

4.4.2.2.2 Naming of Chemical Substances from Petroleum, Coal, etc.

Chemical substances from sources such as petroleum and coal have complex, variable or partially unclear components. Such substances are named in accordance with GB/T 23955.

4.4.2.2.3 Nomenclature of enzyme chemicals

Enzyme chemicals usually contain 10% to 80% enzyme protein by weight, and the other components are related to the organism that produces the enzyme, the fermentation medium, The fermentation process operating parameters are related to subsequent purification, etc. Enzyme chemicals are named according to GB/T 23955.

Appendix A (Informative

Appendix) Examples of Naming

of Chemical Substances for Environmental Management

Table A.1 Examples of naming of chemical substances for environmental management

Substance Category	name	Naming method description
Single component substances	Sodium hydroxide	The main component of this chemical substance is sodium hydroxide (mass fraction 82%). Impurities: sodium carbonate (9% by mass), sodium chloride (9% by mass).
	1,2-Dinitrobenzene	The main component of this chemical substance is 1,2-dinitrobenzene (mass fraction 95%), impurity nitrobenzene (mass fraction 5%).
Multi-component substances	Reaction products containing [aniline; naphthalene]	This chemical substance is a product obtained through chemical reactions. Its main components include Including aniline (mass fraction 70%), naphthalene (mass fraction 30%), each The main components are arranged in descending order of mass fraction.
	Reaction products containing [benzene; toluene]	This chemical substance is a product obtained through chemical reactions. Its main components include Including benzene (mass fraction 50%), toluene (mass fraction 50%), Since the mass fractions of the main components are the same, the Chinese names are Arranged in different pinyin orders.
	Contains *[(2R,3R)-2,3* -dihydroxybutyric acid ; (2S,3S)-2,3-dihydroxybutyric acid] The reaction product	This chemical substance is a product obtained through chemical reactions. Its main components include Including (2R,3R)-2,3-dihydroxybutyric acid (mass fraction 50%), (2S,3S)-2,3 -dihydroxybutyric acid (mass fraction 50%), due to the main components The numbers are the same, so the order is based on the first different letter in the Chinese name. This
	Reaction products containing [1,2-dimethylbenzene; 1,3-dimethylbenzene]	chemical substance is a product obtained through chemical reaction. Its main components include 1,2-xylene (mass fraction 50%) and 1,3-xylene (mass fraction 50%). Since the mass fractions of the main components are the same, the chemical substances are arranged in the order Arrange in ascending order according to the first different number in the Chinese name.
Basic nomenclature for polymer sources	Polyethylene	The monomer of the chemical substance is ethylene, and it is named according to its source. The name obtained by the method is polyethylene.
	Styrene, polymer with acrylonitrile	The monomers of the chemical substance polymerization reaction are styrene and acrylonitrile. The name derived from the source-based nomenclature is the polymerization of styrene and acrylonitrile thing.
	2-Ethylhexyl acrylate Polymers of 2,2'-azobis[2-methylbutyronitrile] initiated with alkenylbenzene and 2-methyl-2-[(1-oxo-2-propenyl)amino]-1-propanesulfonic acid	The polymerization monomers of this chemical substance are 2-ethylhexyl acrylate, vinylbenzene, 2-methyl-2-[(1-oxo-2-propenyl)amino]-1-propanesulfonic acid, and the initiator is 2,2'-azobis[2-methylbutyronitrile]. The name obtained according to the source-based nomenclature is 2-ethylhexyl acrylate and vinylbenzene, 2-2,2'-azobis[2-methylbutyronitrile]-initiated polymer of methyl-2-[(1-oxo-2-propenyl)amino]-1-propanesulfonic acid.

Continued

Substance Category		name	Naming method description
Nomenclature of polymer structures		Poly(1-cyanoethylene)	The repeating structural unit of this chemical substance is 1-cyanoethylene, and the name obtained according to the structural basis nomenclature is poly(1-cyanoethylene). The repeating
		Poly[1-(methoxycarbonyl)-1-methylethylene]	structural unit of this chemical substance is 1-(methoxycarbonyl)-1-methylethylene, and the name obtained according to the structural basis nomenclature is poly[1-(methoxycarbonyl)-1-methylethylene]. The source of this chemical substance is 2-
UVCB	General UVCB	2-Hydroxy-4-(3-propoxy)benzophenone, reaction products with triethoxysilane and (methyltrimethylsilane and silicic acid hydrolyzate)	hydroxy-4-(3-propoxy)benzophenone, triethoxysilane, methyltrimethylsilane and silicic acid hydrolysis product. Its processing method The formula is a synthesis reaction.
		Cashew nut shell decarboxylated distilled extract	The source of the chemical is cashew nut shells, which are processed by Extraction by carboxylation and distillation.
		Linseed oil and tetraethylenepentamine Epoxidation reaction products	The source of this chemical is linseed oil and tetraethylenepentamine, and its processing The method is epoxidation reaction.
	Carbon chain length Chemical substances	C10-18 fatty acid cadmium salts	The alkyl index of this chemical substance is an alkane with a chain length of C10-18, and the functional group index is The label is fatty acid and the salt index is cadmium salt.

References

[1] Chinese Chemical Society Organic Compound Nomenclature Approval Committee. Principles of Organic Compound Nomenclature [M]. Beijing: Science Press, 2017.

[2] Chinese Chemical Society. Principles of Inorganic Chemistry Nomenclature [M]. Beijing: Science Press, 1982. [3]

National Committee for Scientific and Technological Terminology Approval. Principles of Polymer Chemistry Nomenclature [M]. Beijing: Science Press, 2005.