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COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS AND ON THE GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS

Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals

Eighth session, 6-9 December 2004
Item 2(d) of the provisional agenda

UPDATING OF THE GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS)

Draft amendments to the GHS

Note by the secretariat

This document contains the draft amendments to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) adopted by the Sub-Committee of Experts at its fifth, sixth and seventh sessions.

DRAFT AMENDMENTS TO THE GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS) (ST/SG/AC.10/30)

PART 1:

Chapter 1.2:

Delete the definition of "aerosols".

PART 2

Chapters 2.8, 2.11 and 2.12:

In the title of chapters 2.8, 2.11 and 2.12, add "and mixtures" after "substances". (*This amendment does not apply to the French version of the publication*).

PART 3

Chapter 3.7:

3.7.1.1 In the third line, replace "at the IPCS/OECD Workshop for the Harmonization of risk assessment for Reproductive and Developmental Toxicity, Carshalton, UK, 17-21 October, 1994" with "as working definitions in IPCS/EHC Document N° 225, Principles for Evaluating Health Risks to reproduction Associated with Exposure to Chemicals" and delete the footnote.

In the first bullet, replace "reproductive ability or capacity" with "sexual function and fertility".

Insert the following new sentences in the end:

"Some reproductive toxic effects cannot be clearly assigned to either impairment of sexual function and fertility or to developmental toxicity. Nonetheless, chemicals with these effects would be classified as reproductive toxicants with a general hazard statement."

3.7.1.2 In the title and in the first line, replace "reproductive ability or capacity" with "sexual function and fertility".

In the fourth line, insert "pregnancy outcomes," between "parturition," and "premature reproductive senescence,".

3.7.2.1 Replace "reproductive ability and capacity" with "sexual function and fertility" and delete "as separate issues".

Figure 3.7.1 (a)

CATEGORY 1 In the title, delete "or development".

In the second line, replace "reproductive ability or capacity" with sexual function and fertility".

CATEGORY 1A In the title, replace "to have produced an adverse effect on reproductive ability or capacity or on development in humans" with "human reproductive toxicant".

CATEGORY 1B In the title, replace "to produce an adverse effect on reproductive ability or capacity or on development in humans" with "human reproductive toxicant".

In the second sentence under the title, replace "specific reproductive toxicity" with "an adverse effect on sexual function and fertility or on development".

CATEGORY 2 In the title, delete "or development".

In the third line, replace "reproductive ability or capacity" with "sexual function and fertility".

3.7.2.2.1 In the second sentence, delete "or developmental" after "reproductive" and "or development" after reproduction.

3.7.2.5.3 In the second line, replace "reproductive ability and capacity" with "reproductive function".

3.7.5.1 In the second box on the left, replace the text in the two bullets with the following text:

- "a known human reproductive toxicant, or"
- "a presumed human reproductive toxicant?".

In the third box on the left, replace "suspected to produce an adverse effect on reproductive ability or capacity, or on development, in humans" with "a suspected human reproductive toxicant".

Chapter 3.8:

3.8.1.1 Insert "and not specifically addressed in chapters 3.1 to 3.7" between "delayed" and "are included".
At the end of the paragraph, insert "See also Paragraph 3.8.1.6".

3.8.1.6 Replace the last sentence with the following:

"Other specific toxic effects, listed below are assessed separately in the GHS and consequently are not included here:

- acute lethality/toxicity (Chapter 3.1),
- skin corrosivity/irritation (Chapter 3.2),
- serious damage to eyes/irritation (Chapter 3.3),
- skin and respiratory sensitization (Chapter 3.4),
- mutagenicity (Chapter 3.5),
- carcinogenicity (Chapter 3.6), and
- reproductive toxicity (Chapter 3.7)."

After Paragraph 3.8.1.6, insert a new Paragraph 3.8.1.7 as follows:

"3.8.1.7 The classification criteria in this chapter are organized as criteria for substances Categories 1 and 2 (3.8.2), criteria for substances Category 3 (3.8.3) and criteria for mixtures (3.8.4). See Figure 3.8.1."

3.8.2 In the title, insert "-Category 1 and 2" after "Classification criteria for substances";

3.8.2.1 Replace "one of two categories" with "Category 1 or Category 2".

At the end of this paragraph, insert "(Figure 3.8.1)".

Figure 3.8.1 Insert above "***NOTE***" at the bottom of the box the following text:

"CATEGORY 3: Transient Target Organ effects

There are target organ effects for which a substance/mixture may not meet the criteria to be classified in Categories 1 or 2 indicated above. These are effects which adversely alter human function for a short duration after exposure and from which humans may recover in a reasonable period without leaving significant alteration of structure or function. This category only includes narcotic effects and respiratory tract irritation. Substances/mixture may be classified specifically for these effects as discussed in 3.8.3."

In the first line of the note, replace "both" with "these".

3.8.2.7 In the title, insert "for Category 1 and 2" after "Effects considered to support classification".

3.8.2.7.3 In the first line of the second bullet, replace "in the" with ", more than transient in nature, in the respiratory system,";

In the second bullet, insert ",other organs" between "peripheral nervous systems" and "or other organ systems".

3.8.2.8 In the title, insert "for Category 1 and 2" after "Effects considered not to support classification";

Delete the sixth bullet.

3.8.2.9 In the title, insert "for Category 1 and 2" after "experimental animals".

Table 3.8.1 Insert "[1]" at the end of the title of the table and text for category 3 in the box as follows:

Table 3.8.1: Guidance value ranges for single-dose exposures[1]

		Guidance value ranges for :		
Route of exposure	**Units**	**Category 1**	**Category 2**	**Category 3**
Oral (rat)	mg/kg body weight	C ≤ 300	2000 ≥ C > 300	**Guidance values do not apply[2]**
Dermal (rat or rabbit)	mg/kg body weight	C ≤ 1000	2000 ≥ C > 1000	
Inhalation (rat) gas	Ppm	C ≤ 2500	5000 ≥ C > 2500	
Inhalation (rat) vapour	mg/1	C ≤ 10	20 ≥ C > 10	
Inhalation (rat) dust/mist/ Fume	mg/l/4h	C ≤ 1.0	5.0 ≥ C > 1.0	

Insert "***NOTE 1***" before the note under the table;

Insert a new note after "***NOTE 1***" as follows:

NOTE 2: *Guidance values are not provided since this classification is primarily based on human data. Animal data may be included in the weight of evidence evaluation.*

3.8.3 Replace with a new section **3.8.3** as follows:

"**3.8.3** ***Classification criteria for substances -- Category 3***

3.8.3.1 ***Criteria for Respiratory Tract Irritation***

The criteria for respiratory tract irritation as category 3 are:

- Respiratory irritant effects (characterized by localised redness, edema, pruritis and/or pain) that impair function with symptoms such as cough, pain, choking, and breathing difficulties are included. It is recognized that this evaluation is based primarily on human data.

- Subjective human observations could be supported by objective measurements of clear respiratory tract irritation (RTI) (eg. electrophysiological responses, biomarkers of inflammation in nasal or bronchoalveolar lavage fluids).

- The symptoms observed in humans should also be typical of those that would be produced in the exposed population rather than being an isolated idiosyncratic reaction or response triggered only in individuals with hypersensitive airways. Ambiguous reports simply of 'irritation' should be excluded as this term is commonly used to describe a wide range of sensations including those such as smell, unpleasant taste, a tickling sensation, and dryness, which are outside the scope of this classification endpoint.

- There are currently no validated animal tests that deal specifically with RTI, however, useful information may be obtained from the single and repeated inhalation toxicity tests. For example, animal studies may provide useful information in terms of clinical signs of toxicity (dyspnoea, rhinitis etc) and histopathology (e.g. hyperemia, edema, minimal inflammation, thickened mucous layer) which are reversible and may be reflective of the characteristic clinical symptoms described above. Such animal studies can be used as part of weight of evidence evaluation.

- This special classification would occur only when more severe organ/systemic effects including in the respiratory system are not observed.

3.8.3.2 ***Criteria for Narcotic effects***

The criteria for Narcotic Effects as category 3 are:

- Central nervous system depression including narcotic effects in humans such as drowsiness, narcosis, reduced alertness, loss of reflexes, lack of coordination, and vertigo are included. These effects can also be manifested as severe headache or nausea, and can lead to reduced judgment, dizziness, irritability, fatigue, impaired memory function, deficits in perception and coordination, reaction time, or sleepiness.

- Narcotic effects observed in animal studies may include lethargy, lack of coordination righting reflex, narcosis, and ataxia. If these effects are not transient in nature, than they should be considered for classification as category 1 or 2.";

3.8.4 Replace with original section **3.8.3** and renumber accordingly;

Insert a new paragraph 3.8.4.4.5 after the renumbered paragraph 3.8.4.4.4 as follows:

"3.8.4.4.5 Care should be exercised when extrapolating toxicity of a mixture that contains category 3 ingredient(s). A cut off value of 20% has been suggested; however, it should be recognized that this cut-off value may be higher or less depending on the Category 3 ingredient(s) and that some effects such as respiratory tract irritation may not occur below a certain concentration while other effects such as narcotic effects may occur below this 20% value. Expert judgment should be exercised."

3.8.5 Replace with original section **3.8.4** and renumber accordingly.

Table 3.8.2 Insert "as category 1 or 2" at the end of the table title

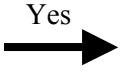
Table 3.8.3 Insert text for category 3 in the box as follows:

	Category 1	**Category 2**	**Category 3**
Symbol	Health Hazard	Health Hazard	**Exclamation Mark**
Signal word	Danger	Warning	**Warning**
Hazard statement	Causes damage to organs (or state all organs affected, if known) if (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)	May cause damage to organs (or state all organs affected, if known) if (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)	**May cause respiratory irritation or May cause drowsiness and dizziness**

Renumber original section 3.8.5 as 3.8.6.

In the Decision logic 3.8.1, insert in the appropriate format, before the last arrow on the left and the last box on the right, the following:

No

Following single exposure, • Can the substance or the mixture produce Narcotic Effects or Respiratory Tract Irritation? See 3.8.3 for criteria. Application of the criteria needs expert judgment in a weigh of evidence approach.	Yes 	Category 3  Warning

In the Decision logic 3.8.2, insert in the appropriate format, before the last arrow on the left and the last box on the right, the following:

No ↓

Does the mixture contain one or more ingredients classified as Category 3 target organ systemic toxicant at a concentration > 20%? See 3.8.4.4.5 Care should be exercised when classifying such mixtures.	Yes →	Category 3  Warning

Chapter 3.11:

Insert a new Chapter 3.11 in the end of Part 3 of the GHS, as follows:

"CHAPTER 3.11: ASPIRATION HAZARDS

3.11.1 Definitions and general considerations

3.11.1.1 The purpose of this Chapter is to provide a means of classifying substances or mixtures that may pose an aspiration toxicity hazard to humans.

3.11.1.2 “Aspiration" means the entry of a liquid or solid chemical product directly through the oral or nasal cavity, or indirectly from vomiting, into the trachea and lower respiratory system.

3.11.1.3. Aspiration toxicity includes severe acute effects such as chemical pneumonia, varying degrees of pulmonary injury or death following aspiration.

3.11.1.4 Aspiration is initiated at the moment of inspiration, in the time required to take one breath, as the causative material lodges at the crossroad of the upper respiratory and digestive tracts in the laryngopharyngeal region.

3.11.1.5 Aspiration of a substance or mixture can occur as it is vomited following ingestion. This may have consequences for labelling, particularly where, due to acute toxicity, a recommendation may be considered to induce vomiting after ingestion. However, if the substance/mixture also presents an aspiration toxicity hazard, the recommendation to induce vomiting may need to be modified.

3.11.2 Classification criteria for substances

Table 3.11.1: Hazard categories for aspiration toxicity

Categories	Criteria
Category 1: Chemicals known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard	**A substance is classified in Category 1:** **(a) Based on reliable and good quality human evidence (See note 1);. or** **(b) If it is a hydrocarbon and has a kinematic viscosity of 20.5 mm^2/s or less, measured at 40° C.**
Category 2: Chemicals which cause concern owing to the presumption that they cause human aspiration toxicity hazard	**On the basis of existing animal studies and expert judgment that takes into account surface tension, water solubility, boiling point, and volatility, substances, other than those classified in Category 1, which have a kinematic viscosity of 14 mm^2/s or less, measured at 40º C (See note 2).**

NOTE 1: *Examples of substances included in Category 1 are certain hydrocarbons, turpentine and pine oil.*

NOTE 2: *Taking this into account, some authorities would consider the following to be included in this Category: n-primary alcohols with a composition of at least 3 carbon atoms but not more than 13; isobutyl alcohol, and ketones with a composition of no more than 13 carbon atoms.*

3.11.3. Classification criteria for mixtures

3.11.3.1 *Classification when data are available for the complete mixture*

A mixture is classified in Category 1 based on reliable and good quality human evidence.

3.11.3.2 *Classification of mixtures when data are not available for the complete mixture: Bridging Principles*

3.11.3.2.1 *Dilution*

If a mixture is diluted with a substance that does not pose an aspiration toxicity hazard, and which is not expected to affect the aspiration toxicity of other ingredients or the mixture, then the new mixture may be classified as equivalent to the original mixture. However, the concentration of aspiration toxicant(s) should not drop below 10%.

3.11.3.2.2 *Batching*

The aspiration toxicity of one production batch of a complex mixture can be assumed to be substantially equivalent to that of another production batch of the same commercial product, and produced by or under the control of the same manufacturer, unless there is reason to believe there is significant variation such that the aspiration toxicity, reflected by viscosity or concentration, of the batch has changed. If the latter occurs, new classification is necessary.

3.11.3.2.3 *Concentration of category 1 mixtures*

If a mixture is classified in Category 1, and the concentration of the ingredients of the mixture that are in Category 1 is increased, the new mixture should be classified in Category 1 without additional testing.

3.11.3.2.4 *Interpolation within one toxicity category*

For three mixtures with identical ingredients, where A and B are in the same toxicity category and mixture C has the same toxicologically active ingredients with concentrations intermediate to the concentrations of those ingredients in mixtures A and B, then mixture C is assumed to be in the same toxicity category as A and B.

3.11.3.2.5 *Substantially similar mixtures*

Given the following:

(a) Two mixtures: (i) A + B
(ii) C + B;

(b) The concentration of ingredient B is essentially the same in both mixtures;

(c) The concentration of ingredient A in mixture (i) equals that of ingredient C in mixture (ii);

(d) Aspiration toxicity for A and C is substantially equivalent, i.e. they are in the same hazard category and are not expected to affect the aspiration toxicity of B.

If mixture (i) is already classified based on the criteria in table 3.11.1, then mixture (ii) can be assigned the same hazard category.

3.11.3.3 ***Classification of mixtures when data are available for all components or only some components of the mixture***

3.11.3.3.1 *Category 1*

3.11.3.3.1.1 A mixture which contains a total of 10% or more of a substance or substances classified in Category 1, and has a kinematic viscosity of 20.5 mm^2/s or less, measured at 40 °C, may be classified in Category 1.

3.11.3.3.1.2 In the case of a mixture that separates into two or more distinct layers, one of which contains 10 % or more of a substance or substances classified in Category 1 aspiration toxicity hazard and has a kinematic viscosity of 20.5 mm^2/s or less, measured at 40 °C, then the entire mixture is classified in Category 1.

3.11.3.3.2 *Category 2*

3.11.3.3.2.1 A mixture which contains a total of 10% or more of a substance or substances classified in Category 2, and has a kinematic viscosity of 14 mm^2/s or less, measured at 40 °C, may be classified in Category 2.

3.11.3.3.2.2 In classifying mixtures in this category, the use of expert judgment that considers surface tension, water solubility, boiling point, volatility is critical and especially when Category 2 substances are mixed with water.

3.11.3.3.2.3 In the case of classifying a mixture that separates into two or more distinct layers, one of which contains 10 % or more of a substance or substances classified in Category 2 and has a kinematic viscosity of 14 mm^2/s or less, measured at 40 °C, then the entire mixture is classified in Category 2.

3.11.4 Specific considerations

3.11.4.1 A review of the medical literature on chemical aspiration revealed that some hydrocarbons (petroleum distillates) and certain chlorinated hydrocarbons have been shown to pose an aspiration hazard in humans. Primary alcohols, and ketones have been shown to pose an aspiration hazard only in animal studies.

3.11.4.2 While a methodology for determination of aspiration hazard in animals has been utilized, it has not been standardized. Positive experimental evidence with animals can only serve as a guide to possible aspiration toxicity in humans. Particular care must be taken in evaluating animal data for aspiration hazards.

3.11.4.3 The classification criteria refer to kinematic viscosity. The following provides the conversion between dynamic and kinematic viscosity:

Dynamic viscosity (mPas)/density (g/cm^3)=kinematic viscosity (mm^2/s)

3.11.4.4 Classification of aerosol/mist products: Aerosol and mist products are usually dispensed in containers such as self-pressurized containers, trigger and pump sprayers. The key to classifying these products is whether a pool of product is formed in the mouth, which then may be aspirated. If the mist or aerosol from a pressurized container is fine, a pool may not be formed. On the other hand, if a pressurized container dispenses product in a stream, a pool may be formed that may then be aspirated. Usually, the mist produced by trigger and pump sprayers is coarse and therefore, a pool may be formed that then may be aspirated. When the pump mechanism may be removed and contents are available to be swallowed then it should be considered for classification.

3.11.5 Hazard communication

3.11.5.1 General and specific considerations concerning labelling requirements are provided in *Hazard Communication: Labelling* (Chapter 1.4). Annex 2 contains summary tables about classification and labelling. Annex 3 contains examples of precautionary statements and pictograms, which can be used where allowed by the competent authority. The table below presents specific label elements for substances and mixtures that are classified as posing an aspiration toxicity hazard, Categories 1-2 based on the criteria set forth in this chapter.

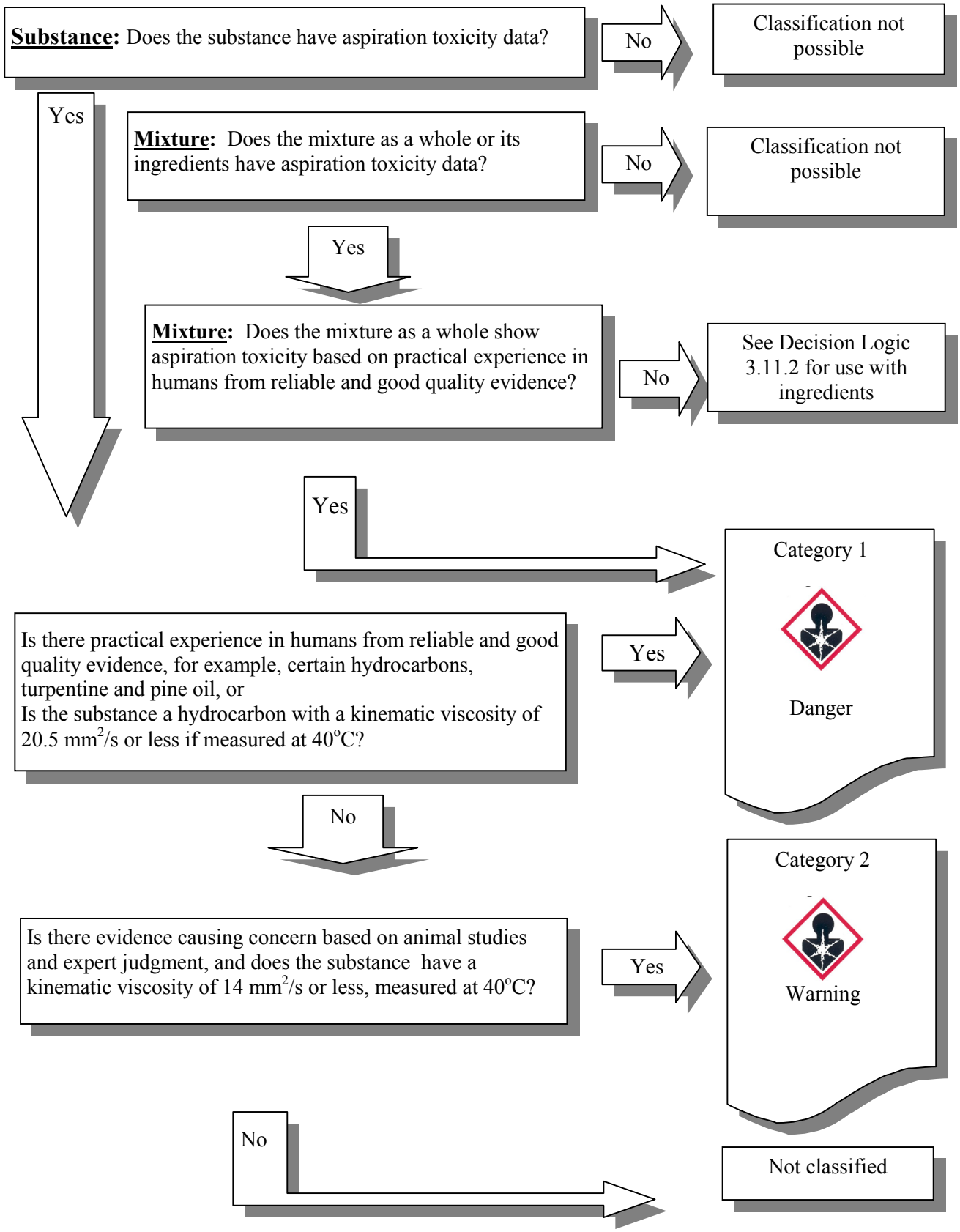
Table 3.11.2: Aspiration Toxicity Label Elements

	Category 1	**Category 2**
Symbol	Health Hazard	Health Hazard
Signal word	Danger	Warning
Hazard statement	May be fatal if swallowed and enters airways	May be harmful if swallowed and enters airways

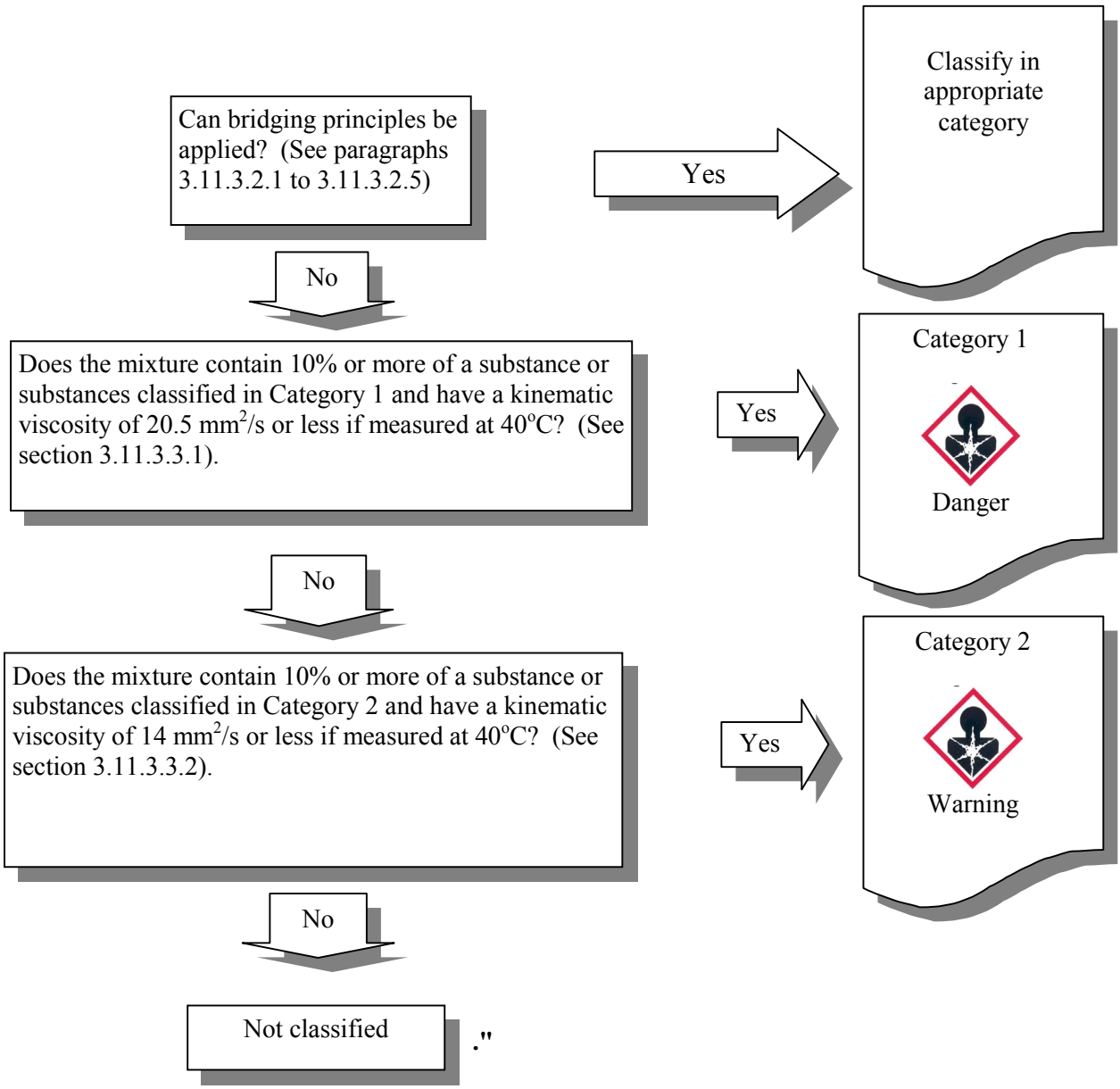
3.11.6 Decision logic for aspiration toxicity

The decision logic that follows is not part of the harmonized classification system but is provided here as additional guidance. It is strongly recommended that the person responsible for classification study the criteria before and during use of the decision logic.

3.11.6.1 Decision Logic 3.11.1 for Aspiration Toxicity



3.11.6.2 ***Decision Logic 3.11.2 for Aspiration Toxicity***



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