



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

Forty-fourth session

Geneva, 10-12 July 2023

Item 2 (h) of the provisional agenda

Work on the Globally Harmonized System of Classification and Labelling of Chemicals: Hazard communication for gases addressed in the Montreal Protocol and other conventions

Revision of chapter 4.2 to include classification and hazard communication for greenhouse gasses listed in the annexes of the Montreal Protocol

**Transmitted by the experts from Austria, Finland, Germany, the
United Kingdom, the United States of America and the European
Union***

Introduction

1. At the forty-second session¹, the Sub-Committee acknowledged that a gap had been introduced into the GHS following the adoption and entry into force of the “Kigali amendment” (Annex F) to the Montreal Protocol regarding hydrofluorocarbons that are known greenhouse gases.
2. At the forty-third session², the Sub-Committee considered potential options on how to take forward the work and all the experts who expressed an opinion were in favour of option 2 (i.e. renaming chapter 4.2 and adding a second hazard class), while there was also some support to extend the scope of the GHS to cover additional hydrofluorocarbons or all greenhouse gases (potential “future work”) in a separate chapter, as detailed in informal document INF.37 from the forty-third session.
3. This document, together with informal document INF.3, presents for the consideration of the Sub-Committee, the proposed revision of chapter 4.2 by the small group of interested delegations, the authors of this paper.

* A/77/6 (Sect. 20), table 20.6

¹ See informal document INF.14 and report ST/SG/AC.10/C.4/84 from the forty-second session.

² See informal document INF.37 and report ST/SG/AC.10/C.4/86 from the forty-third session.



Discussion

4. In January 2023, the group commenced their work to revise chapter 4.2 to contain two hazard classes in separate sub-sections to articulate their different criteria and hazard communication elements, similar to what has already been achieved in chapter 2.3 “Aerosols and chemicals under pressure”. These two hazard classes are:

- (a) **“Hazardous to the ozone layer”** – the existing hazard class provided in chapter 4.2 for ozone-depleting substances, with minor amendments to the criteria to provide clarification that this hazard class relates only to substances with ozone depleting potential that are listed in the annexes of Montreal Protocol given the introduction of hydrofluorocarbons into those annexes via the “Kigali amendment”. Technically the current criteria for this hazard class are incorrect (slightly) for substances listed in the annexes without an ozone depleting potential.
- (b) **“Hazardous by contributing to global warming”** – this is the proposed new hazard class to cover hydrofluorocarbons substances listed in the annexes to the Montreal Protocol. Hydrofluorocarbons have global warming potential and the group considered that the proposed name of this new hazard class would also be applicable if in the future the Montreal Protocol was amended further to include new annexes to list other substances with global warming potential without requiring further amendment to the GHS. The proposed criteria, decision logic and hazard communication elements have all been based on those used for the “hazardous to the ozone layer” hazard class but with minor amendments (i.e., use the term: “with a global warming potential” instead of “with an ozone depleting potential”) and a new hazard statement (“Harms public health and the environment by contributing to global warming”) to ensure these are specific to the new hazard class.

5. In addition, the group propose to rename the chapter to **“Hazardous to the atmospheric system”** which encompasses both hazard classes. Also, keeping in mind that future work is anticipated, the new chapter name is expected to be inclusive of other potential air related hazard(s) that may be incorporated into the chapter in the future.

6. Other key proposed amendments to the chapter include:

- (a) the introduction of new hazard criteria for the new hazard class: “Hazardous by contributing to global warming”;
- (b) amendment of the label element table for “Hazardous to the ozone layer” to reflect the new title of the chapter and to include the label elements for the new hazard class: “Hazardous by contributing to global warming”;
- (c) the introduction of a new decision logic for the new hazard class: “Hazardous by contributing to global warming”;
- (d) the introduction of a new paragraph under the hazard communications section to allow for the combination of hazard statements for those substances and mixtures that are classified into both hazard classes.

Conforming changes to chapter 1.2 and annexes 1 and 3

7. The proposed changes to chapter 4.2 necessitate a number of conforming changes to be made to chapter 1.2; annex 1 (table A1.30); and annex 3 (tables A3.1.3 and A3.2.5; and section 3 (the matrix tables)), as provided in the annex of this document.

Action and next steps

8. The authors of this paper considered adding the precautionary statement P273 “Avoid release to the environment” to both hazard classes. However, given the limited scope of this work (i.e., to clarify the scope of the GHS hazard class “hazardous to the ozone layer” following adoption of the “Kigali amendment”) further future work is anticipated. It is unclear what impact this future work will have on the scope or need for the precautionary

statement. Therefore, the authors of this paper recommend that the precautionary statement be addressed in the context of future work.

9. The Sub-Committee is invited to consider the proposed amendments to chapter 4.2, together with the conforming changes to chapter 1.2 and annexes 1 and 3 of the GHS, as set out in the annex to this document and as provided in full in informal document INF.3.

Annex

Proposed amendments to chapter 4.2

Chapter title Amend to read “**HAZARDOUS TO THE ATMOSPHERIC SYSTEM**”

4.2.1 Amend the heading to read “**Definitions and general considerations**”.

Insert a new paragraph beneath the amended heading to read:

“This chapter covers substances and mixtures that are hazardous to the atmospheric system due to their ozone depleting and/or global warming potential. For the purposes of this chapter, the following definitions apply:”

Move the existing definition “*Montreal Protocol* is ...” to place it before the existing definition for “*Ozone Depleting Potential*”

In the existing definition of “Ozone Depleting Potential” delete: “(ODP)” in the first sentence and replace “ODP” with “ozone depleting potential” in the second sentence.

Insert the following new definition for “*Global warming potential*” after the definition for “*Ozone Depleting Potential*” to read:

“*Global Warming Potential* is a metric that compares the ability of a substance or mixture to trap heat in the atmosphere as compared to a benchmark gas (generally carbon dioxide). The formal definition of global warming potential is the cumulative radiative forcing, both direct and indirect effects, over a specified time horizon resulting from the emission of a unit mass of gas relative to that of carbon dioxide (as the reference gas).”

4.2.2 Delete the superscripted footnote reference “1” and insert a new paragraph 4.2.2.1 under the heading “classification criteria” to read as follows:

“4.2.2 Classification criteria

4.2.2.1 Substances and mixtures are classified into the hazardous to the ozone layer hazard class due to their ozone depleting potential in accordance with 4.2.2.2 and/or hazardous by contributing to global warming hazard class by their global warming potential in accordance with 4.2.2.3, independently.”

4.2.2.2 Place the existing sentence under “classification criteria” (“A substance or mixture...”) under a new heading 4.2.2.2 and amend as follows:

“4.2.2.2 *Hazardous to the ozone layer*

A substance or mixture shall be classified in Category 1 hazardous to the ozone layer according to the following table¹.”

Table 4.2.1, column “Criteria” Replace “listed in annexes to” with “listed with an ozone depleting potential in annexes to” and “listed in the annexes to the” with “listed with an ozone depleting potential in the annexes to the”.

4.2.2.3 Insert the following new section after table 4.2.1:

“4.2.2.3 Hazardous by contributing to global warming

A substance or mixture shall be classified in Category 1 hazardous to global warming according to the following table¹:

Table 4.2.2: Criteria for substances and mixtures that are hazardous by contributing to global warming

Category	Criteria
1	Any of the controlled substances listed with a global warming potential in annexes to the Montreal Protocol; or Any mixture containing at least one ingredient listed with a global warming potential in the annexes to the Montreal Protocol, at a concentration ≥ 0.1 %

Footnote 1 Amend the text of the footnote (now related to 4.2.2.2 and 4.2.2.3) to read as follows:

“¹ The criteria in this chapter are intended to be applied to substances and mixtures. Equipment, articles or appliances (such as refrigeration or air conditioning equipment) containing substances hazardous to the atmospheric system are beyond the scope of these criteria. Consistent with 1.1.2.5 (a)(iii) regarding pharmaceutical products, GHS classification and labelling criteria do not apply to medical inhalers at the point of intentional intake.”

4.2.3 Amend to read as follows:

“4.2.3 Hazard communication

4.2.3.1 General and specific considerations concerning labelling requirements are provided in *Hazard Communication: Labelling* (chapter 1.4). Annex 1 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. Table 4.2.3 presents specific label elements for substances and mixtures classified into this hazard class based on the criteria in this chapter.

Table 4.2.3: Label elements for substances and mixtures hazardous to the atmospheric system

	Category 1	Category 1
	Hazardous to the ozone layer	Hazardous by contributing to global warming
Symbol	Exclamation mark	Exclamation mark
Signal word	Warning	Warning
Hazard statement	Harms public health and the environment by destroying ozone in the upper atmosphere	Harms public health and the environment by contributing to global warming

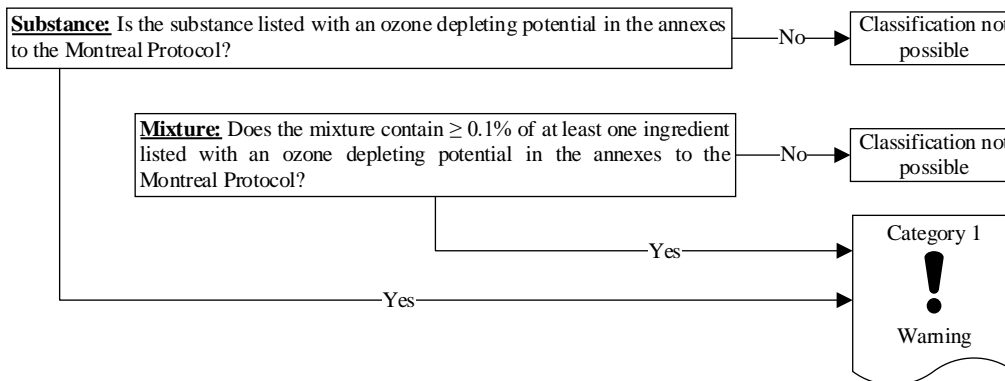
4.2.3.2 Some substances and mixtures meet the criteria for classification as hazardous to the ozone layer and hazardous by contributing to global warming. In these cases, the principles outlined in A3.1.2.5 for combining hazard statements can be used to combine the hazard statements for both hazard classes into a single hazard statement (i.e., Harms public health and the environment by contributing to global warming and destroying ozone in the upper atmosphere.)”

4.2.4 Amend to read as follows:

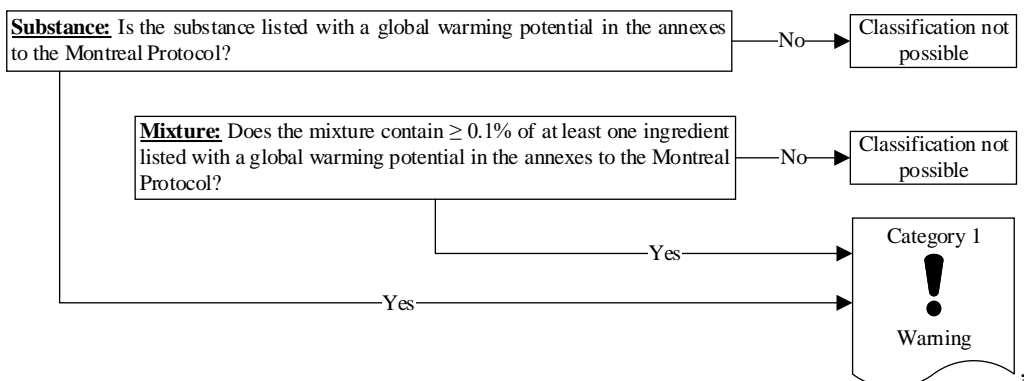
“4.2.4 Decision logics for substances and mixtures hazardous to the atmospheric system

The decision logics for hazardous to the ozone layer (see 4.2.2.2) and hazardous by contributing to global warming (see 4.2.2.3) which follow are not part of the harmonized classification system but is provided as additional guidance. It is strongly recommended that the person responsible for classification study the criteria before and during use of these decision logics.

Decision logic 4.2.1 for hazardous to the ozone layer



Decision logic 4.2.2 for hazardous by contributing to global warming



Proposed conforming changes to chapter 1.2

Insert the following new definition in the alphabetical order:

“*Global Warming Potential* is a metric that compares the ability of a substance or mixture to trap heat in the atmosphere as compared to a benchmark gas (generally carbon dioxide). The formal definition of global warming potential is the cumulative radiative forcing, both direct and indirect effects, over a specified time horizon resulting from the emission of a unit mass of gas relative to that of carbon dioxide (as the reference gas).”


For the existing definition of “*Ozone Depleting Potential*”, delete “(ODP)” in the first sentence and replace “ODP” with “ozone depleting potential” in the second sentence.

Proposed conforming changes to annex 1

Table A1.30

Amend to read as follows:

“A1.30 Hazardous to the atmospheric system (see chapter 4.2 for classification criteria)

Classification			Labelling				GHS hazard statement code
GHS hazard class	GHS hazard category	UN Model Regulations class or division	GHS pictogram	UN Model Regulations pictograms	GHS signal word	GHS hazard statement	
Hazardous to the ozone layer	1	<i>Not applicable</i>		<i>Not applicable</i>	Warning	Harms public health and the environment by destroying ozone in the upper atmosphere	H420
Hazardous by contributing to global warming	1					Harms public health and the environment by contributing to global warming	H421

”

Proposed conforming changes to annex 3, section 1

Table A3.1.3

Insert the following new entry after the existing entry for H420:

(1)	(2)	(3)	(4)
H421	Harms public health and the environment by contributing to global warming	Hazardous by contributing to global warming (chapter 4.2)	1

Proposed conforming changes to annex 3, section 2

Table A3.2.5, P502

Insert the following new row after the existing row for “Hazardous to the ozone layer (chapter 4.2)”:

(1)	(2)	(3)	(4)	(5)
		Hazardous by contributing to global warming (chapter 4.2)	1	


Proposed conforming changes to annex 3, section 3

In the existing matrix table for “Hazardous to the ozone layer”, amend the heading to read as follows:

**“HAZARDOUS TO THE ATMOSPHERIC SYSTEM
(CHAPTER 4.2)
(Hazardous to the ozone layer)”**

Insert a new matrix table for the new “Hazardous by contributing to global warming” hazard class, after the renamed matrix table for “Hazardous to the atmospheric system (chapter 4.2) (Hazardous to the ozone layer)”, to read as follows:

**“HAZARDOUS TO THE ATMOSPHERIC SYSTEM
(CHAPTER 4.2)
(Hazardous by contributing to global warming)”**

Hazard category	Symbol		Signal word	Hazard statement
1	Exclamation mark		Warning	H421 Harms public health and the environment by contributing to global warming

Precautionary statements			
Prevention	Response	Storage	Disposal
			P502 Refer to manufacturer or supplier for information on recovery or recycling.

”