Secretariat

**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**

Twentieth session
Geneva, 7–9 December 2010
Item 2 (e) of the provisional agenda
**Updating of the third revised edition of the Globally Harmonized System
of Classification and Labelling of Chemicals (GHS) – Miscellaneous proposals**

Draft amendments to the third revised edition of the GHS adopted in principle by the Sub-Committee at its nineteenth session

Note by the secretariat[1]

I. Background

1.   At its nineteenth session, the Sub-Committee examined several informal documents containing proposals for amendment to the third revised edition of the GHS. Noting that the amendment proposals were circulated as informal documents, the Sub-Committee agreed to adopt them in principle, pending their submission to the twentieth session in an official document for final endorsement (refer to the report of the Sub-Committee on its nineteenth session, document ST/SG/AC.10/C.4/38, paragraph 9).

2.   The proposed amendments to the third revised edition of the GHS, as adopted in principle by the Sub-Committee at its nineteenth session, are reproduced hereafter.

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[1] In accordance with the report of the Sub-Committee of experts on its nineteenth session (see ST/SG/AC.10/C.4/38, paragraphs 8–10, 12, 23 and 24).

II. Draft amendments to the third revised edition of the GHS adopted in principle by the Sub-Committee at its nineteenth session

Chapter 2.1

2.1.2.1 (f)   Delete "detonating"

(Reference document: ST/SG/AC.10/C.4/38, paragraph 12)

Chapter 2.2

2.2.4.2 and 2.2.5 (heading) Replace "ISO 10156:1996" with "ISO 10156:2010"

(Reference document: ST/SG/AC.10/C.4/38, paragraphs 8 and 9)

Chapter 2.3

2.3.2.2   In the note, replace "*extremely flammable (Category 1)*" with "*flammable aerosols, Category 1*"

(Reference document: ST/SG/AC.10/C.4/38, paragraph 10)

Chapter 2.4

2.4.1   In the note, replace "ISO 10156:1996 or 10156-2:2005" with "ISO 10156:2010"

(Reference document: ST/SG/AC.10/C.4/38, paragraphs 8 and 9)

2.4.4.1   Replace "ISO 10156:1996" with "ISO 10156:2010" and delete "and ISO 10156-2:2005 "Gas cylinders, Gases and gas mixtures. Part 2: Determination of oxidizing ability of toxic and corrosive gases and gas mixtures""

(Reference document: ST/SG/AC.10/C.4/38, paragraphs 8 and 9)

2.4.4.2   Replace with the following:

"**2.4.4.2   Guidance**

Example of the classification of an oxidizing gas mixture by calculation according to ISO 10156:2010.

The classification method described in ISO 10156 uses the criterion that a gas mixture should be considered as more oxidising than air if the oxidising power of the gas mixture is higher than 0.235 (23.5%).

The oxidizing power (OP) is calculated as follows:

$$OP = \frac{\sum_{i=1}^{n} x_i C_i}{\sum_{i=1}^{n} x_i + \sum_{k=1}^{p} K_k B_k}$$

Where:

   x_i =   molar fraction of the i:th oxidising gas in the mixture;
   C_i =   coefficient of oxygen equivalency of the i:th oxidising gas in the mixture;
   K_k =   coefficient of equivalency of the inert gas k compared to nitrogen;
   B_k =   molar fraction of the k:th inert gas in the mixture;
   n =   total number of oxidising gases in the mixture;
   p =   total number of inert gases in the mixture;

Example mixture: $9\%(O_2) + 16\%(N_2O) + 75\%(He)$

Calculation steps

Step 1:

Ascertain the coefficient of oxygen equivalency (Ci) for the oxidising gases in the mixture and the nitrogen equivalency factors (K_k) for the non-flammable, non-oxidising gases.

Ci (N_2O)   = 0.6 (nitrous oxide)
Ci (O_2)   = 1 (oxygen)
K_k (He)   = 0.9 (helium)

Step 2:

Calculate the oxidising power of the gas mixture

$$OP = \frac{\sum_{i=1}^{n} x_i C_i}{\sum_{i=1}^{n} x_i + \sum_{k=1}^{p} K_k B_k} = \frac{0.09 \times 1 + 0.16 \times 0.6}{0.09 + 0.16 + 0.75 \times 0.9} = 0.201 \qquad \mathbf{20.1 < 23.5}$$

Therefore the mixture is <u>not</u> considered as an <u>oxidising gas</u>".

(Reference document: ST/SG/AC.10/C.4/38, paragraphs 8 and 9)

Chapter 2.5

2.5.1   In the definition of gases under pressure, insert "at 20°C" after "or more"

(Reference document: ST/SG/AC.10/C.4/38, paragraphs 23 and 24)

2.5.2   In the introductory sentence before table 2.5.1, replace "Gases" with "Gases under pressure".
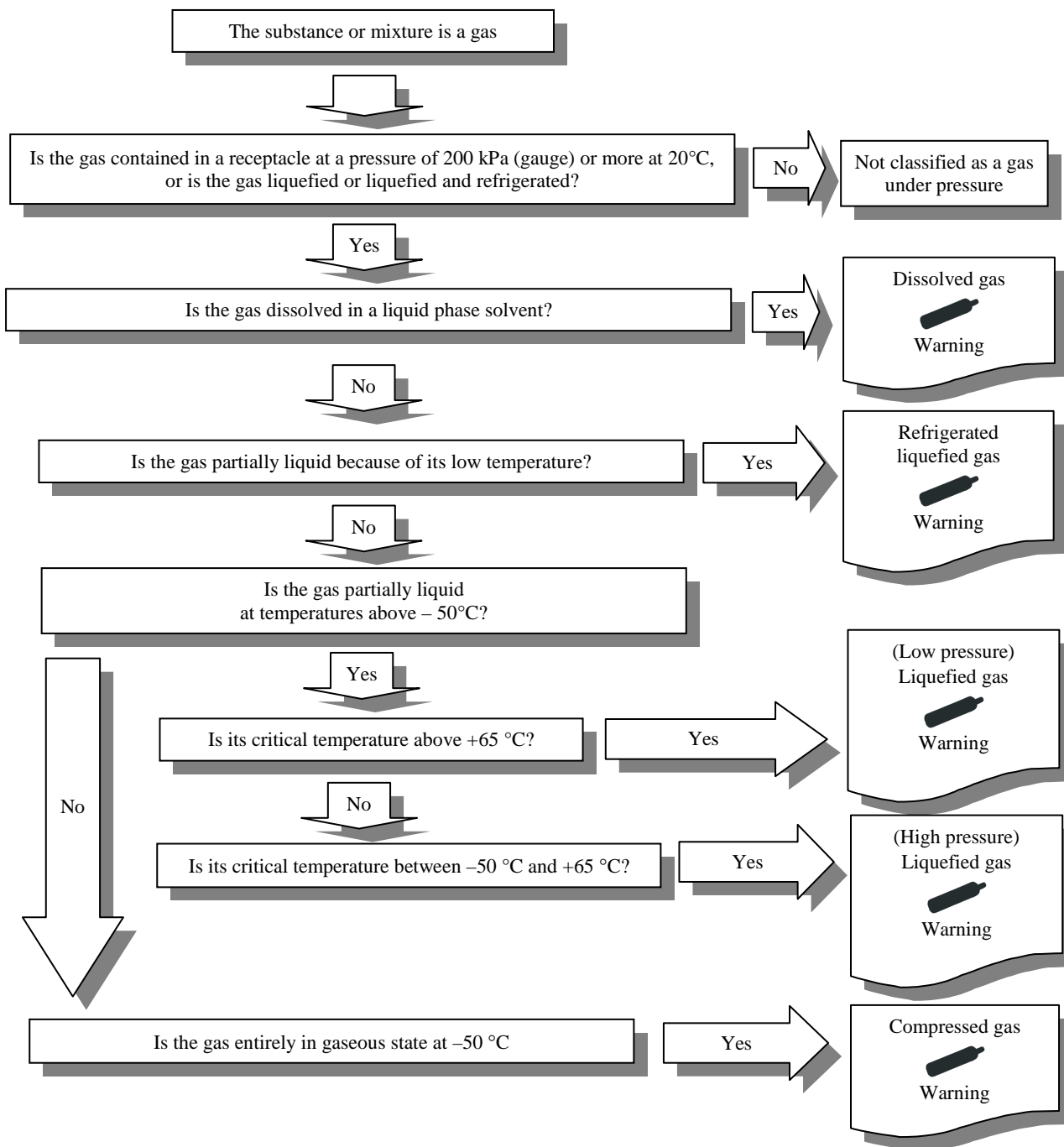
(Reference document: ST/SG/AC.10/C.4/38, paragraphs 23 and 24)

2.5.4.1   Replace with the following:

"**2.5.4.1**   **Decision logic**

        Classification can be made according to decision logic 2.5

        Decision logic 2.5 for gases under pressure

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                    ┌─────────────────────────────────┐
                    │ The substance or mixture is a gas │
                    └─────────────────────────────────┘
                                   │
                                   ▼
┌──────────────────────────────────────────────────────────┐        ┌──────────────────────┐
│ Is the gas contained in a receptacle at a pressure of 200  │  No ▶  │ Not classified as a   │
│ kPa (gauge) or more at 20°C, or is the gas liquefied or    │        │ gas under pressure    │
│ liquefied and refrigerated?                                 │        └──────────────────────┘
└──────────────────────────────────────────────────────────┘
                                   │ Yes
                                   ▼
┌──────────────────────────────────────────────────────────┐        ┌──────────────────────┐
│ Is the gas dissolved in a liquid phase solvent?            │  Yes ▶ │ Dissolved gas         │
└──────────────────────────────────────────────────────────┘        │ Warning               │
                                   │ No                               └──────────────────────┘
                                   ▼
┌──────────────────────────────────────────────────────────┐        ┌──────────────────────┐
│ Is the gas partially liquid because of its low temperature? │  Yes ▶ │ Refrigerated          │
└──────────────────────────────────────────────────────────┘        │ liquefied gas         │
                                   │ No                               │ Warning               │
                                   ▼                                  └──────────────────────┘
┌──────────────────────────────────────────────────────────┐
│ Is the gas partially liquid at temperatures above – 50°C?  │
└──────────────────────────────────────────────────────────┘
                                   │ Yes
                                   ▼
           ┌────────────────────────────────────────┐        ┌──────────────────────┐
           │ Is its critical temperature above +65 °C? │  Yes ▶ │ (Low pressure)        │
           └────────────────────────────────────────┘        │ Liquefied gas         │
                                   │ No                        │ Warning               │
                                   ▼                           └──────────────────────┘
           ┌────────────────────────────────────────────┐    ┌──────────────────────┐
           │ Is its critical temperature between –50 °C    │ Yes ▶ │ (High pressure)      │
           │ and +65 °C?                                   │    │ Liquefied gas         │
           └────────────────────────────────────────────┘    │ Warning               │
   No │                                                        └──────────────────────┘
      ▼
┌──────────────────────────────────────────────────────────┐        ┌──────────────────────┐
│ Is the gas entirely in gaseous state at –50 °C             │  Yes ▶ │ Compressed gas        │
└──────────────────────────────────────────────────────────┘        │ Warning               │
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(Reference document: ST/SG/AC.10/C.4/38, paragraphs 23 and 24)