

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

Sixteenth session
Geneva, 10-12 (a.m.) December 2008
Item 2 (e) of the provisional agenda

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

Comments on units of concentration of ingredients in mixtures

Transmitted by the European Industrial Gases Association (EIGA)

Introduction

1. Concentrations in gas mixtures are expressed in volume or mole %. Expressing the concentration of the active ingredient in weight % in a gas mixture would be completely misleading due the great differences of molecular weight (MW) between the dilution gases. For instance, a mixture of 1 % v/v of chlorine (MW = 71) in helium or argon is equivalent to 15.4 % w/w in helium (MW = 4) and 1.8 % w/w in argon (MW = 44) although the number of molecules of chlorine is the same in both mixtures. Using weight percent could lead to different classification for the same level of hazard.
2. In the Purple Book, the units of the concentrations of the ingredients in a mixture are not specified the same way in each hazard class:
3. In chapter 2.2 (Flammable gases) and chapter 2.4 (Oxidising gases) it is clear that the concentrations are in volume.
4. In chapter 3.1 (Acute Toxicity) it is specified in 3.1.3.3 that “the relevant ingredients are those who are present in concentrations > 1% (...v/v for gases). A similar sentence exists in Chapter 3.2 (paragraph 3.2.3.3.1) and in Chapter 3.3 (paragraph 3.3.3.3.1)
5. In chapter 3.4 the percentage concentrations are expressed without units (nor w/w, nor v/v),
6. In Chapter 3.5, the Note under Table 3.5.1 specifies that for gases the cut-off values are in v/v for gases.

7. There is no such Note under the equivalent Table 3.6.1 in Chapter 3.6 and under Table 3.7.1, in Chapter 3.7, neither in Chapters 3.8 nor in chapter 3.9. But the reader could deduct that the same rule on the units applies in the chapters where no rule is specified.

8. Chapter 3.10 is not applicable to gases.

9. The situation changes in chapter 4.1, where concentrations of ingredient are expressed in weight percentage only in 4.1.3.5.2

Conclusion

10. There is no consistency throughout the Purple Book in the units specifying the concentration of the ingredients in mixtures:

- in v/v for gases and w/w for liquids, vapours and dusts in chapters 3.1, 3.2, 3.3 and 3.5
- no units in chapter 3.4, 3.7, 3.7, 3.8 and 3.9
- in w/w only in chapter 4.1

Proposal

11. EIGA proposes:

- (a) to delete the reference to w/w in chapter 4.1 and
- (b) to add a new paragraph 1.3.3.2 5 to read as follows:

“1.3.3.2.5 Concentrations of ingredients in mixtures are expressed in w/w for solids, liquids, dusts, mists and vapours, and in v/v for gases.”
