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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
Transport of Dangerous Goods

Twenty-ninth session
Geneva, 3-12 (a.m.) July 2006
Item 6 of the provisional agenda

LISTING, CLASSIFICATION AND PACKING

Proposals to change the classification of UN No. 1017 Chlorine

Transmitted by the expert from Germany

Introduction

The UN Recommendations on the Transport of Dangerous Goods, Model Regulations, fourteenth revised edition, already refer to the Standard ISO 10156:1996 for the classification of flammable gases under 2.2.2.1 (a) (ii) and for the determination of flammability for mixture of gases under 2.2.3 (a).

The Globally Harmonised System of Classification and Labelling of Chemicals (GHS), first revised edition, refers to the Standard ISO 10156:1996 for the classification of oxidizing gases under 2.4.4.1 and for the determination of oxidizing ability for mixture of gases under 2.4.4.2 .

ISO recently published Part 2 for the determination of oxidizing ability of toxic and corrosive gases. The new Part 2 standard presents the current knowledge and allows more accurate determination of the oxidizing ability for gas mixtures containing toxic and corrosive gases. Therefore in document ST/SG/AC.10/C.3/2006/2 (ST/SG/AC.10/C.4/2006/2) EIGA proposes that reference should be made to Part 2 of the updated ISO Standard.

The scope of this standard – ISO 10156-2:2005 - is described as follows:

"This part of ISO 10156 specifies a test and a calculation method to be used for determining whether or not a gas (or a gas mixture) is more oxidizing than air. This part of ISO 10156 only applies to toxic and corrosive gases and gas mixtures."

In a table – Table 1 – Coefficients of oxygen equivalency (C_i) of toxic and corrosive gases - a lot of coefficients C_i for the description of the oxidizing properties of gases are listed. The values for the coefficients generally have been derived from experimental data (1, 2).

A section of that table is shown below:

Oxidizer	C_i
Oxygen	1.00
Chlorine	0.7
Fluorine	40 ^a
Nitric oxide	0.3
Nitrogen trifluoride	1.6

^a For non-tested oxidizing gases, the C_i values are fixed conservatively to be 40.

As shown in the table by definition the coefficient C_i of oxygen is 1.00.

Because of its oxygen content of 20.9 % air has a C_i of 0.209. One can see that the oxidizing ability of chlorine with a C_i of 0.7 is more than three times greater than the oxidizing potential of air.

In 2.2.2.1 of the UN Model Regulations gases are defined as oxidizing if they "may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does". Even chapter 2.4 of the Globally Harmonized System (GHS) uses the same criterion for an oxidizing gas: "Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does."

The gas chlorine therefore must be classified as oxidizing.

Proposal for the UN Model Regulations

Chapter 3.2 DANGEROUS GOODS LIST

For UN No. 1017 CHLORINE add in column 4 (Subsidiary risk) "5.1".

Chapter 4.1.4 List of packing instructions

In P200, Table 2, add for UN No. 1017 CHLORINE in the 4th column (Subsidiary risk) "5.1".

Literature

1. SCHRÖDER, V., MACKRODT, B. AND DIETLEN, S. "*Determination of oxidizing ability of gases and gas mixtures*", ASTM STP 1395, Flammability and Sensitivity of Materials in Oxygen-Enriched Atmospheres: Ninth Volume (2000).
 2. GUSTIN, J.L. and FINES, A. "*Safety of chlorination reactions*", Loss Prevention and Safety Promotion in the Process Industries, Volume I, Elsevier Science B.V. (1995).
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