



**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****Thirty-eighth session**

Geneva, 29 November–7 December 2010

Item 4 of the provisional agenda

Listing, classification and packing**Dimethyl disulphide (UN 2381): subsidiary risk 6.1****Transmitted by the expert from Germany¹****Introduction**

1. Dimethyl disulphide is a volatile liquid that is listed in Chapter 3.2 of the Model Regulations under UN 2381 and is currently assigned to Class 3, flammable liquids, packing group II.
2. In recent years, a number of cases were reported where short-term exposure to accidentally released dimethyl disulphide vapour on board ships resulted in symptoms of acute poisoning such as nausea, headache, faintness, and respiratory problems.
3. Experimental data reported in the scientific literature² indicate that dimethyl disulfide meets the criteria for classification in Division 6.1, packing group II, due to its toxicity by inhalation in conjunction with its volatility. The reported LC₅₀ value in rats of 805 ppm after 4 h exposure can be converted to an estimated value of 1610 ppm after 1 h exposure, taking into account paragraph 2.6.2.2.4.5 of the Model Regulations. Based on a reported vapour pressure of 2930 Pa at 20 °C, the saturated vapour concentration of dimethyl disulphide at 20 °C and standard atmospheric pressure is calculated as 113.30 g/m³ corresponding to 26000 ppm. Thus, the criteria for assignment to Division 6.1, packing group II are met: $V \geq LC_{50}$ and $LC_{50} \leq 3000 \text{ ml/m}^3$.

¹ In accordance with the programme of work of the Sub-Committee for 2009-2010 approved by the Committee at its fourth session (refer to ST/SG/AC.10/C.3/68, para. 118 (b) and ST/SG/AC.10/36, para. 14).

² *MF Tansy et al.*, *J. Toxicol. Environ. Health, A: Curr. Iss.*, 8 (1981) 71-88.

4. Following paragraph 2.0.3 of the Model Regulations (Precedence of hazard characteristics), dimethyl disulphide would remain to be classified under Class 3, with the addition of subsidiary risk 6.1. Accordingly, entry UN 2381 would need to be amended as outlined below. The proposed amendment will lead to assignment of T7 instead of T4, therefore a transitional period should be included in the Model Regulations as well.

5. The updated data sheet for dimethyl disulphide is contained in the Annex to this document.

Proposal

6. Amend the entry for UN 2381 in the Dangerous Goods List of Chapter 3.2 to read as follows:

UN No.	Name and description	Class or division	Subsidiary risk	UN packing group	Special provisions	Limited and excepted quantities		Packagings and IBCs		Portable tanks and bulk containers	
						(7a)	(7b)	Packing instruction	Special provisions	Instruction	Special provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
2381	DIMETHYL DISULPHIDE	3	6.1	II	354	1 L	E2	P001 IBC02		T7	TP2 TP13 TPXX

7. Add a new TP XX in 4.2.5.3 as follows:

“TP XX The portable tank instructions prescribed in the Model Regulations annexed to the 16th revised edition of the Recommendations on the Transport of Dangerous Goods may continue to be applied until 31 December 2016.”.

Annex**Data sheet to be submitted to the United Nations for new or amended classification of substances**

[English only]

Submitted by.....GERMANY Date31 August 2010

Supply all relevant information including sources of basic classification data. Data should relate to the product in the form to be transported. State test methods. Answer all questions - if necessary state "not known" or "not applicable" - If data is not available in the form requested, provide what is available with details. Delete inappropriate words.

Section 1. SUBSTANCE IDENTITY

- 1.1 Chemical name **Dimethyl disulphide**
- 1.2 Chemical formula **C2 H6 S2**
- 1.3 **Other names/synonyms** Methylthiomethane
- 1.4.1 **UN number** 2381 **1.4.2..... CAS number** 624-92-0
- 1.5 **Proposed classification for the Recommendations**
- 1.5.1 Proper shipping name (3.1.2) **DIMETHYL DISULPHIDE**.....
- 1.5.2 Class/division **3**..... subsidiary risk(s) **6.1**
 packing group **II**.....
- 1.5.3 Proposed special provisions, if any **354**
- 1.5.4 Proposed packing instruction(s) **P001**

Section 2. PHYSICAL PROPERTIES

- 2.1 **Melting point or range**-87.4 °C
- 2.2 **Boiling point or range**109.6 °C
- 2.3 Relative density at :
- 2.3.1.....15 °C
- 2.3.2.....20 °C **1.063**
- 2.3.3.....50 °C
- 2.4 Vapour pressure at :
- 2.4.1.....50 °C kPa
- 2.4.2.....65 °C kPa
- 20 °C 2.93 kPa**

- 2.5 Viscosity at 20 °C
- 2.6 **Solubility in water at 20 °C2500 ppm**
- 2.7 Physical state at 20°C (2.2.1.1) **liquid**
- 2.8 **Appearance at normal transport temperatures, including colour and odour**
yellow liquid, odour threshold in air 6 ppm
- 2.9 **Other relevant physical properties**

Section 3. FLAMMABILITY

- 3.1 **Flammable vapour**
 - 3.1.1 Flash point (2.3.3) **16 °C cc**
 - 3.1.2 Is combustion sustained? (2.3.1.3)
- 3.2 **Autoignition temperature .. °C**
- 3.3 **Flammability range (LEL/UEL) %**
- 3.4 Is the substance a flammable solid? (2.4.2) **no**
 - 3.4.1 If yes, give details

Section 4. CHEMICAL PROPERTIES

- 4.1 Does the substance require inhibition/stabilization or other treatment such as nitrogen blanket to prevent hazardous reactivity? **no**
If yes, state:
 - 4.1.1 Inhibitor/stabilizer used
 - 4.1.2 Alternative method
 - 4.1.3 Time effective at 55 °C.....
 - 4.1.4 Conditions rendering it ineffective
- 4.2 Is the substance an explosive according to paragraph 2.1.1.1? (2.1) **no**
 - 4.2.1 If yes, give details
- 4.3 Is the substance a desensitized explosive? (2.4.2.4) **no**
 - 4.3.1 If yes, give details

- 4.4 Is the substance a self-reactive substance? (2.4.1) **no**
 If yes, state:
- 4.4.1 Exit box of flow chart
 What is the self-accelerating decomposition temperature (SADT) for a 50 kg package?°C
 Is the temperature control required? (2.4.2.3.4) yes/no
- 4.4.2 Proposed control temperature for a 50 kg package °C
- 4.4.3 Proposed emergency temperature for a 50 kg package ... °C
- 4.5 Is the substance pyrophoric? (2.4.3) **no**
- 4.5.1 If yes, give details
- 4.6 Is the substance liable to self-heating? (2.4.3) **no**
- 4.6.1 If yes, give details
- 4.7 Is the substance an organic peroxide (2.5.1) **no**
 If yes state:
- 4.7.1 Exit box of flow chart
 What is the self accelerating decomposition temperature (SADT) for a 50 kg package?°C
 Is temperature control required? (2.5.3.4.1) yes/no
- 4.7.2 Proposed control temperature for a 50 kg package °C
- 4.7.3 Proposed emergency temperature for a 50 kg package ... °C
- 4.8 Does the substance in contact with water emit flammable gases? (2.4.4) **no**
- 4.8.1 If yes, give details
- 4.9 Does the substance have oxidizing properties (2.5.1) **no**
- 4.9.1 If yes, give details

- 4.10 Corrosivity (2.8) to:
- 4.10.1mild steel mm/year at °C
- 4.10.2aluminium mm/year at °C
- 4.10.3other packaging materials (specify)
 mm/year at °C
 mm/year at °C
- 4.11 Other relevant chemical properties

Section 5. HARMFUL BIOLOGICAL EFFECTS

- 5.1 LD₅₀, oral (2.6.2.1.1) **190** mg/kg Animal Species **Rat**
- 5.2 LD₅₀, dermal (2.6.2.1.2) **>2000** mg/kg Animal Species **Rabbit**
- 5.3 LC₅₀, inhalation (2.6.2.1.3)mg/l. Exposure time **4** hours
 or**805**ml/m³ Animal species..... **Rat**
- 5.4 Saturated vapour concentration at 20 °C (2.6.2.2.4.3) **26000** ml/m³
- 5.5 Skin exposure (2.81) results **moderately irritating** Animal Species: **Rabbit**
- 5.6 Other data
- 5.7 Human experience
 Workers exposed to 0.31 ppm complained of headaches.

Section 6. SUPPLEMENTARY INFORMATION**6.1 Recommended emergency action**

6.1.1 Fire (include suitable and unsuitable extinguishing agents)

Extinguish fire using water spray. Cargoes in tanks exposed to heat may explode suddenly in or after a fire – keep tanks cool with water, fight fire from a protected position.

6.1.2 Spillage

Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition, spillage may evolve flammable vapours. Provide good ventilation. Clean area thoroughly with water.

6.2 Is it proposed to transport the substance in:

6.2.1 Bulk Containers (6.8) **yes/no**

6.2.2 Intermediate Bulk Containers (6.5)? **yes/∅**

6.2.3 Portable tanks (6.7)? **yes/∅**

If yes, give details in Sections 7, 8 and/or 9.

Section 7. BULK CONTAINERS (only complete if yes in 6.2.1)

7.1 Proposed type(s)

Section 8. INTERMEDIATE BULK CONTAINERS (IBCs) (only complete if yes in 6.2.2)

8.1 Proposed type(s) **as specified by IBC02**

Section 9. MULTIMODAL TANK TRANSPORT (only complete if yes in 6.2.3)

- 9.1 Description of proposed tank (including IMO tank type if known) **as specified by T7**
 - 9.2 Minimum test pressure
 - 9.3 Minimum shell thickness
 - 9.4 Details of bottom openings, if any
 - 9.5 Pressure relief arrangements**
 - 9.6 Degree of filling..... **as specified by TP2**
 - 9.7 Unsuitable construction materials
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