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COMMITTEE OF EXPERTS ON THE
TRANSPORT OF DANGEROUS GOODS

Sub-Committee of Experts on the
Transport of Dangerous Goods
(Fifteenth session,
Geneva, 29 June-10 July 1998)

Reclassification of UN 2531, Methacrylic acid, inhibited

Transmitted by the European Chemical Industry Council (CEFIC)

CEFIC has recently become aware of a skin irritation/corrosion study on methacrylic acid that has been completed in the United States of America. This study provides new data to justify the transfer of methacrylic acid from Class 8 PG III to Class 8 PG II.

Proposal

The following amendment is proposed:

- In the Dangerous Goods List, amend the entry for methacrylic acid as follows:

UN No.	Name and description	Class or division	Subsid-iary risk	UN packing group	Special provi-sions	Limited quantities	Packagings and IBCs		Portable tanks	
							Packing instruction	Special provi-sions	Portable tank instruction	Portable tank special provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2531	Methacrylic acid, inhibited	8		II		1 L			T4	TP1 TP18

Annex in English only : Data sheet for substances transmitted to the UN for new or amended classification.

Annex

Department of Transport

DTp 10595

United Nations Committee of Experts on the Transport of Dangerous Goods

Data Sheet for substances submitted to the UN for new or amended classification

Submitted by: | **Date:**

Notes

- *Please answer **all** questions - if necessary state **'not known'** or **'not applicable'***
- *Supply **all** the relevant information - including:*
  *- **sources** of basic classification data;*
  *- **test methods** where appropriate*
- *Data should relate to the substance in the **form to be transported.***
- *If data is not available **in the form requested,** please provide what is available, with details.*
- *Please tick boxes ☑ as appropriate (if typing, use an oblique stroke '/')*
- ✻ *Where a reference is given in brackets - eg '(✻**Chapter 4**)' or '(✻**para. 13.8**)' - please refer to that Chapter or paragraph in the **United Nations Recommendations on the Transport of Dangerous Goods.***

1 Substance Identity

1.1 Chemical name: METHACRYLIC ACID

1.2 Chemical formula: $C_4H_6O_2$

1.3 Other names/ synonyms: 2-PROPENOIC ACID, 2-METHYL
ACRYLIC ACID, 2-METHYL

1.4.1 UN no: 2531 | 1.4.2 CAS no: 79-41-4

1.5 **Proposed classification for the Recommendations**

1.5.1 Proper shipping names (✻**para. 13.8**): METHACRYLIC ACID, INHIBITED

1.5.2 Class/Division: 8 | Subsidiary risks: NONE | Packing group: II

1.5.3 Proposed special provisions, if any: NONE

1.5.4 Proposed packing method: PLASTIC OR COMPOSITE DRUMS COMPLYING WITH APPLICABLE MODAL REGS

2 Physical Properties

2.1 Melting Point or range: 14-16 °C | 2.2 Boiling point or range: 160-162 °C

2.3 **Relative density at these temperatures:**

2.3.1 15°C: FREEZES | 2.3.2 20°C: 1.015-1.02 | 2.3.3 50°C: 0.983

2.4 **Vapour pressure at these temperatures:**

2.4.1 50°C: 0.95 kPa | 2.42 65°C: 1.3 kPa

2.5 Viscosity at 20°C: 1.3-1.45 m²/sec | 2.6 Solubility in water at 20°C: 9.8 g/100ml

2.7 Physical state at 20°C: (✻**paras. 1.10 & 1.15**) solid ☐ liquid ☑ gas ☐

2.8 Appearance at normal carriage temperatures, including **colour** and **odour**: COLOURLESS LIQUID WITH PUNGENT ODOUR.

2.9 Other relevant physical properties: NOT APPLICABLE

3 Flammability

3.1 Flashpoint (**para. 5.4*): 65-73 °C oc/cc

3.2 Autoignition temperature: 365-400 °C

3.3 Flammability range (LEL/UEL): 1.6 % to 8.7 at65-96 deg C % and 1000 HPa

3.4 Is the substance an inflammable solid? Yes ☐ No ☑

3.4.1 If 'Yes', give details here: Then complete 4.5.1 and 4.5.2 if relevant (**para. 1.21*)

4 Chemical Properties

4.1 Does the substance require inhibition/stabilization or other treatment (such as a nitrogen blanket) to prevent hazardous reactivity? Yes ☑ No ☐

If 'Yes', state:

4.1.1 Inhibitor/ stabilizer used: HYDROQUINONE OR p- METHOXYPHENOL (MEHQ)

4.1.2 Alternative method: NOT APPLICABLE

4.1.3 Time effective at 55°C: GREATER THAN 2 YEARS WITH 200ppm p-METHOXYPHENOL

4.1.4 Conditions rendering it ineffective: ABSENCE OF OXYGEN
EXESSIVE HEAT OR CATALYSTS (EG PEROXY OR AZO COMPOUNDS STRONG ACIDS, ALKALIS, OXIDISING AGENTS & METAL SALTS)

4.2 Does the substance react with water? Yes ☐ No ☑

4.2.1 If 'Yes', state effects:

4.3 Does the substance have explosive properties? (**Chapter 4*) Yes ☐ No ☑

4.3.1 If 'Yes', give details: HOWEVER IT IS A COMBUSTIBLE LIQUID

4.4 Does the substance have oxidising properties? (**para. 1.22*) Yes ☐ No ☑

4.4.1 If 'Yes', give details:

4.5 Is the substance an organic peroxide? *(*para. 1.22)* Yes ☐ No ☑

If 'Yes', or if the answer to 3.4 was 'Yes', please state:

4.5.1 proposed control temperature *(*para. 11.3.5.9)*: °C

4.5.2 proposed emergency temperature *(*para. 11.3.5.9)*: °C

4.6 Corrosivity to packaging materials *(*Chapter 8)*:

	Material	mm/year	°C
4.6.1	mild steel	NOT KNOWN	
4.6.2	aluminium	NOT KNOWN	
4.6.3 (others - please specify)	NOT STANDARD METHOD: ALUMINIUM	LESS THAN 0.1	40

4.7 Other relevant chemical properties: NOT KNOWN

5 Harmful Biological Effects

5.1 LD50, oral: *(*para. 6.3-6.5)* 1060 - 2260 mg/kg Animal species: RAT

5.2 LD50, dermal: *(*para. 6.3-6.5)* 1000 - 2000mg/kg Animal species: RABBIT

5.3 LC50, inhalation: *(*para. 6.3-6.5)* 7.1 mg/litre or ~~ml/kg~~ Exposure time: 4 hours Animal species: RAT

5.4 Saturated vapour concentration at 20°C: *(*para. 6.4.3)* 2.68 ml/m³

5.5 Skin exposure results *(*Chapter 8)*: SKIN CORROSION (ESCHAR) DEVELOPED AT SITE OF CONTACT AFTER 24 HOURS.

Exposure time: hrs 3 mins Animal species: RABBIT

5.6 Other data: NOT KNOWN

5.7 Human experience: NOT KNOWN

6 Supplementary Information

6.1 Recommended emergency action

6.1.1 Fire (include suitable & unsuitable extinguishing agents)

SELF CONTAINED BREATHING APPARATUS AND PROTECTIVE EQUIPMENT SHOULD BE WORN. POLAR RESISTANT FOAM, CO_2 OR DRY POWDER. WATER SPRAY SHOULD BE USED TO COOL CONTAINERS.

6.1.2 Spillage

WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING RESPIRATORY PROTECTION. CONTAIN SPILLAGE WITH SAND, EARTH OR SUITABLE ABSORBANT NON COMBUSTIBLE MATERIAL. NEUTRALISE WITH LIME SLURRY AND TRANSFER TO CONTAINER FOR DISPOSAL. WASH WITH WATER. WASHINGS SHOULD NOT ENTER DRAINS OR WATER COURSES.

6.2 Proposed containers for transporting the substance

6.2.1 Intermediate Bulk Containers? *(*Chapter 16)* Yes ☑ No ☐

If 'Yes', give details in 7.1 below:

6.2.2 Multimodal tanks? *(*Chapter 12)* Yes ☑ No ☐

If 'Yes', give details in 8.1 to 8.7 below.

7 Intermediate Bulk Containers (only complete if the answer to 6.2.1 is 'Yes')

7.1 Proposed type(s):

AS NOW: STAINLESS STEEL (31A), ALUMINIUM (31H1 OR 31H2) AND COMPOSITE (31HZ1, 31HA2, 31HH2) PROVIDED THAT THEY COMPLY WITH RESPECTIVE MODAL REGULATIONS.

8 Multimodal Tank Transport (only complete if the answer to 6.2.2 is 'Yes')

8.1 Description of proposed tank (including IMO tank type, if known):

AS NOW: IMO TANK TYPE 1: INSTRUCTIONS T4 WITHH SPECIAL PROVISIONS TP1 & TP18

8.2 Minimum test pressure: AS NOW: 2.65 bar

8.3 Minimum shell thickness: AS NOW: 5mm TO 1.8M 6mm ABOVE 1.8M mm

8.4 Details of bottom openings, if any: AS NOW: 3 SERIAL INDEPENDENT SHUT OFF DEVICES. SELF CLOSING INTERNAL STOP VALVE. EXTERNAL STOP VALVE FITTED AS CLOSE TO VESSEL AS PRACTICAL. LIQUID TYPE CLOSURE AT END OF PIPE.

8.5 Pressure relief arrangements: AS NOW: 1 OR MORE SPRING LOADED DEVICES.

8.6 Degree of filling: $\frac{95}{1+\alpha(Tr-Tf)}$

8.7 Unsuitable construction materials: MILD STEEL, COPPER

DATA SHEET FOR SUBSTANCES SUBMITTED TO THE UN FOR NEW OR AMMENDED CLASSIFICATION: METHACRYLIC ACID

Source documentation:
A recently produced Joint Assessment of Commodity Chemicals (JACC) report published by ECETOC is available and reviews all published and company literature that is available on methacrylic acid.

1. Substance Identity

1.1-1.4.2 ECETOC JACC No 35 March, 1996.
1.5-1.5.3 UN Orange Book.
1.5.4 Manufacturers Guidelines and Modal Regulations

2. Physical Properties

2.1 & 2.2 ECETOC JACC No 35 March, 1996.
2.3.1-2.4.2 Methacrylic Acid Safe Handling Manual, Methacrylate Producers Association, 1350 Eye Street, N.W., Suite 200, Washington, DC 20005.
2.5-2.9 ECETOC JACC No 35 March, 1996.

3. Flammability

3.1-3.4 ECETOC JACC No 35 March, 1996.

4. Chemical Properties

4.1-4.1.1 ECETOC JACC No 35 March, 1996.
4.1.3 ICI Report GC/TS/Methac/89/102: ICI Acrylics, Cassel, PO Box 8, Billingham, Cleveand, UK.
4.1.4-4.6.2 ECETOC JACC No 35 March, 1996.
4.6.3 Company Technical Data reports.
4.7 ECETOC JACC No 35 March, 1996.

5. Harmful Biological Effects

5.1 ECETOC JACC No 35 March, 1996.
5.2 ECETOC JACC No 35 March, 1996. and supporting note 1.
5.3-5.4 ECETOC JACC No 35 March, 1996.
5.5 Rohm & Haas Company Report No 96R-132A; Methacrylic acid skin irritation study in rabbits. Rohm and Haas Company, Toxicology Department, 727 Norristown Rd, PO Box 904, Spring House, PA 19477-0904.
5.6-5.7 ECETOC JACC No 35 March, 1996.

6. Supplimentary Information

6.1-6.1.2 Manufacturers Safety Data Sheets, ECETOC JACC No 35 March, 1996.

7. Intermediate Bulk Containers

7.1 UN Orange Book and IMDG.

8. Multimodal Tank Transport

8.1 UN Orange Book, page 179.
8.2 UN Orange Book, page 295
8.3 UN Orange Book, page 295 & section 6.6.2.4.2
8.4 UN Orange Book, page 295 & section 6.6.2.6.3
8.5 UN Orange Book, Page 295 & section 6.6.2.8
8.6 IMDG, page 0074, section 13.1.22.2
8.7 Manufacturers Material Safety Data Sheet.