

Committee for Risk Assessment
RAC

Opinion
proposing harmonised classification and labelling
at EU level of

Toluene-4-sulphonohydrazide

EC Number: 216-407-3
CAS Number: 1576-35-8

CLH-O-0000006844-66-01/F

Adopted
17 September 2020

OPINION OF THE COMMITTEE FOR RISK ASSESSMENT ON A DOSSIER PROPOSING HARMONISED CLASSIFICATION AND LABELLING AT EU LEVEL

In accordance with Article 37 (4) of Regulation (EC) No 1272/2008, the Classification, Labelling and Packaging (CLP) Regulation, the Committee for Risk Assessment (RAC) has adopted an opinion on the proposal for harmonised classification and labelling (CLH) of:

Chemical name: Toluene-4-sulphonohydrazide

EC Number: 216-407-3

CAS Number: 1576-35-8

The proposal was submitted by **Germany** and received by RAC on **26 July 2019**.

In this opinion, all classification and labelling elements are given in accordance with the CLP Regulation.

PROCESS FOR ADOPTION OF THE OPINION

Germany has submitted a CLH dossier containing a proposal together with the justification and background information documented in a CLH report. The CLH report was made publicly available in accordance with the requirements of the CLP Regulation at <http://echa.europa.eu/harmonised-classification-and-labelling-consultation/> on **12 August 2019**. Concerned parties and Member State Competent Authorities (MSCA) were invited to submit comments and contributions by **11 October 2019**.

ADOPTION OF THE OPINION OF RAC

Rapporteur, appointed by RAC: **Beata Pęczkowska**

No comments were received during the consultation.

The RAC opinion on the proposed harmonised classification and labelling was adopted on **17 September 2020** by **consensus**.

Classification and labelling in accordance with the CLP Regulation (Regulation (EC) 1272/2008)

	Index No	Chemical name	EC No	CAS No	Classification		Labelling			Specific Conc. Limits, M-factors and ATE	Notes
					Hazard Class and Category Code(s)	Hazard statement Code(s)	Pictogram, Signal Word Code(s)	Hazard statement Code(s)	Suppl. Hazard statement Code(s)		
Current Annex VI entry	No current Annex VI entry										
Dossier submitters proposal	TBD	toluene-4-sulphonohydrazide	216-407-3	1576-35-8	Self-react. D	H242	GHS02 Dgr	H242			
RAC opinion	TBD	toluene-4-sulphonohydrazide	216-407-3	1576-35-8	Self-react. D	H242	GHS02 Dgr	H242			
Resulting Annex VI entry if agreed by COM	TBD	toluene-4-sulphonohydrazide	216-407-3	1576-35-8	Self-react. D	H242	GHS02 Dgr	H242			

GROUNDS FOR ADOPTION OF THE OPINION

RAC general comment

Toluene-4-sulphonohydrazide is used for the manufacture of plastic and rubber products. The substance is currently not listed in Annex VI of the CLP Regulation

RAC evaluation of physical hazards

Summary of the Dossier Submitter's (DS) proposal

Toluene-4-sulphonohydrazide (TSH) is solid at 20°C and 101.3 kPa. The substance has melting/freezing point at 110°C at 101.3 kPa. No boiling was observed at 150°C and 101.3 kPa (OECD TG 103 by distillation at the temperature 0-150°C). Thus, the boiling point of the test item could not be determined. The sample degraded above 150°C.

Explosivity

In a standard EEC A.14 study (BAM, 1992), the substance "TRACEL TSH 75 k Paste" (toluene-4-sulphonohydrazide as a mixture of 75% TSH and 25 % Paraffin oil) showed explosive properties as it was found to be sensitive to impact (test of mechanical sensitivity with respect to shock).

In a standard A.14 study (BAM, 1994), the substance "TRACEL TSH 110 NER" (composition unknown) is not explosive in the sense of EEC Method A.14, as "TRACEL TSH 110 NER" did not exhibit any thermal or mechanical (impact and friction) sensitivity.

Screening procedures have been used which show that OBSH has chemical groups present in the molecule which are associated with explosive or self-reactive properties with reference to the screening procedures in Appendix 6 of the UN-MTC (Tables A6.1 and A6.3) Secondly, the oxygen balance (-146) identifies the material to be a potential explosive, as it is greater than the limit value of -200.

The traditional aspects of explosive properties, such as detonation, deflagration and thermal explosion, are incorporated in the decision logic Figure 2.8.1 of the CLP Regulation. Consequently, the determination of explosive properties as prescribed in the hazard class explosives needs not to be conducted for self-reactive substances and mixtures (See below).

Flammable solids

In a standard A.10 study (BAM, 1992), the substance "TRACEL TSH 75 k Paste" (toluene-4-sulphonohydrazide as a mixture of 75% TSH and 25 % Paraffin oil) could be ignited but a flameless combustion along 100 mm of more than 45 seconds was measured. It is thus regarded as not highly flammable in the sense of the test method.

In a second study (Korea Testing & Research Institute, 2017) according to EU Method A.10, the substance TSH did not ignite in the preliminary screening test and is thus not regarded as highly flammable in the sense of the test method.

A substance (non-metal powder) is classified as a flammable solid when the burning time is less than 45 seconds or the burning rate is more than 2.2 mm/s, by using UN Test N.1 of the UN RTDG, Manual of Tests and Criteria.

The description of the methods A.10 and UN Test N.1 and the determination of the burning time are comparable with each other, therefore the studies should be considered to be valid. However, explosives, organic peroxides, self-reactive substances and mixtures as well as pyrophoric or oxidising solids should not be considered for classification as flammable solids since flammability

is an intrinsic hazard in these classes. Consequently, the classification criteria of flammable solids need not be applied for self-reactive substances and mixtures (See below).

Self-reactive substances

Self-reactive properties of "TRACEL TSH 75 k Paste" (toluene-4-sulphonohydrazide as a mixture of 75% TSH and 25 % Paraffin oil) have been tested according to UN Test Series A to H in Part II of the UN RTDG, Manual of Tests and Criteria (BAM, 1992).

DSC of "TRACEL TSH 75 k Paste" showed an exothermic decomposition reaction with an energy release of 917 J/g starting at 117°C. In addition, the substance is explosive in the sense of EEC Method A.14, due to six positive results using BAM Fallhammer (mass 10 kg, drop height 40 cm).

The DS concluded that according to the classification principles given in the decision logic in Figure 2.8.1 of CLP, toluene-4-sulphonohydrazide warrants classification as a self-reactive substance of Type D.

Pyrophoric solids

Toluene-4-sulphonohydrazide is known to be stable in contact with air at room temperature for prolonged periods of time (days) and hence, the classification procedure does not need to be applied.

Self-heating substances

The study does not need to be conducted because the substance undergoes exothermic decomposition at a temperature below or equal to 140°C.

Substances which in contact with water emit flammable gases

The study does not need to be conducted because the organic substance does not contain metals or metalloids and hence, the classification procedure does not need to be applied.

Oxidising solids

The study does not need to be conducted, no additional classification as oxidizing is required for explosive substances.

Organic peroxides

The study does not need to be conducted because the substance does not fall under the definition of organic peroxides according to GHS and the relevant UN Manual of tests and criteria.

In conclusion, the classification of toluene-4-sulphonohydrazide as self-reactive substance of Type D is proposed by the DS. The DS proposes that toluene-4-sulphonohydrazide does not require classification for the hazard classes: explosives, flammable solids, pyrophoric solids, self-heating substances, substances which in contact with water emit flammable gases, oxidising solids, and organic peroxides.

Comments received during consultation

No comments were received.

Assessment and comparison with the classification criteria

Toluene-4-sulphonohydrazide is a compound of the type of aromatic sulfohydrazides (-SO₂-NH-NH₂) known as self-reactive substances (according to section 2.8.1 of the Guidance on the Application of the CLP Criteria, Version 5.0 – July 2017).

Based on the result of differential scanning calorimetry (DSC) and an exothermic decomposition reaction with an energy release of 917 J/g, toluene-4-sulphonohydrazide meets the definition of self-reactive substances (according to CLP Regulation, Annex I, 2.8.1.1) as a thermally unstable solid substance liable to undergo a strongly exothermic decomposition.

The self-reactive properties of toluene-4-sulphonohydrazide tested according to UN Test Series A to H described in Part II of the UN RTDG, Manual of Tests and Criteria (BAM, 1992, results provided in confidential Annex of CLH report), fulfil the criteria for classification given in the decision logic in Figure 2.8.1 of CLP Regulation as follows:

- propagation of detonation - a test of UN Test Series A was not performed what was justified by the result "No" obtained from the explosive power test (F.3 BAM Trauzl test) and "Low" result obtained from test E.2 (Dutch pressure vessel test (DPVT)) and "No" result obtained from test E.1 (Koenen test) – exit 1.3;
- propagation of deflagration – result "Yes, slowly" was obtained from the C.1 Time/pressure test– exit 5.2;
- Effect of heating under defined confinement - results "Low" were obtained from the E.1 Koenen test and the E.2 Dutch pressure vessel test (DPVT) – exit – 8.3.

Therefore, toluene-4-sulphonohydrazide meets criterion "*does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement*" (section 2.8.2.3 (d) (ii) for classification as self-reactive substance TYPE D. In conclusion, RAC supports the DS's proposal for classification toluene-4-sulphonohydrazide as Self-react. D, (H242: Heating may cause a fire).

Self-reactive substances and mixtures need to be subjected to temperature control when the SADT is ≤ 55°C. The SADT is defined as the lowest temperature at which self-accelerating decomposition of a substance or mixture may occur in the packaging as used in transport, handling and storage.

Temperature control is not needed based on the SADT of toluene-4-sulphonohydrazide which is above 60°C (for a package of up to 50 kg).

The traditional aspects of explosive properties, such as detonation, deflagration and thermal explosion, are incorporated in the decision logic Figure 2.8.1 of CLP. Consequently, the determination of explosive properties as prescribed in the hazard class explosives need not be conducted for self-reactive substances and mixtures (according to section 2.8.4.1 of Guidance on the Application of the CLP Criteria Version 5.0 – July 2017).

Self-reactive substances and mixtures should not be considered for classification as flammable solids since flammability is an intrinsic hazard in this class (according to section 2.7.3 of Guidance on the Application of the CLP Criteria Version 5.0 – July 2017).

According to CLP Annex I, 2.10.4, the classification procedure for pyrophoric solids need not be applied when experience in manufacture or handling shows that the substance or mixture does not ignite spontaneously on coming into contact with air at normal temperatures (i.e. the substance or mixture is known to be stable at room temperature for prolonged periods of time (days)).

Toluene-4-sulphonohydrazide is known to be stable in contact with air at room temperature for prolonged periods of time (days) and hence, the classification procedure for pyrophoricity is not warranted.

A study for self-heating substances does not need to be conducted because the substance undergoes exothermic decomposition at a temperature below or equal to 140°C.

A study for 'substances which emit flammable gases in contact with water' does not need to be conducted because the organic substance does not contain metals or metalloids and hence, the classification procedure does not need to be applied.

According to screening procedures and waiving of testing (section 2.14.4.1.1 of Guidance on the Application of the CLP Criteria Version 5.0 – July 2017) solids that are classified as explosives should not be subjected to the testing procedures for oxidising solids. Since the screening procedure identifies toluene-4-sulphonohydrazide to be a potential explosive (the substance contains chemical groups associated with explosive and the oxygen balance (-146) is greater than the limit value of -200) the test for oxidising solids does not need to be conducted.

According to definition in CLP Regulation Annex I: 2.15.1 organic peroxides means liquid or solid organic substances which contain the bivalent -O-O- structure and may be considered derivatives of hydrogen peroxide. Therefore, study for organic peroxides does not need to be conducted because the substance does not fall under the definition of organic peroxides.

In conclusion, RAC agrees with DS's proposal to classify toluene-4-sulphonohydrazide as **self-reactive substance TYPE D (Self-react. D, H242: Heating may cause a fire)** and **not to classify the substance for the hazard classes:**

- **explosives,**
- **flammable solids,**
- **pyrophoric solids,**
- **self-heating substances, substances which in contact with water emit flammable gases,**
- **oxidising solids, and**
- **organic peroxides.**

Finally, it should be noted that there is an ongoing information request (decision on a compliance check, decision date 14/05/2020) <https://www.echa.europa.eu/documents/10162/d7a0f521-0f9a-4e69-8e83-c6805ac840b3> for this substance. The classification might have to be revisited in case relevant data e.g. on environmental hazards will become available.

ANNEXES:

Annex 1 The Background Document (BD) gives the detailed scientific grounds for the opinion. The BD is based on the CLH report prepared by the Dossier Submitter; the evaluation performed by RAC is contained in 'RAC boxes'.