



SLOVENSKI STANDARD

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Safety of toys - Part 4: Experimental sets for chemistry and related activities

Sicherheit von Spielzeug; Experimentierkästen für chemische und ähnliche Versuche

Sécurité des jouets - Partie 4 : Coffrets d'expériences chimiques et d'activités connexes

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English Version

Safety of toys - Part 4: Experimental sets for chemistry and related activities

Sécurité des jouets - Partie 4 : Coffrets d'expériences chimiques et d'activités connexes

Sicherheit von Spielzeug; Experimentierkästen für chemische und ähnliche Versuche

This draft European Standard is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 52.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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[SIST EN 71-4:2009](https://standards.iteh.ai/SIST/EN/71-4/2009)

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (prEN 71-4:2009) has been prepared by Technical Committee CEN/TC 52 "Safety of Toys", the secretariat of which is held by DS.

This document is currently submitted to the Unique Acceptance Procedure.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this European Standard.

This document will supersede EN 71-4:1990, EN 71-4/A1:1998, EN 71-4/A2:2003 and EN 71-4/A3:2007.

The significant changes from the previous edition of this standard are:

- the foreword has been updated;
- the introduction has been updated;
- the amendments have been consolidated.

This standard is part of series of standards for safety of toys.

This Part 4 shall be read in conjunction with Part 1.

This European Standard for safety of toys consists of the following parts:

- Part 1: *Mechanical and physical properties*
- Part 2: *Flammability*
- Part 3: *Migration of certain elements*
- Part 4: *Experimental sets for chemistry and related activities*
- Part 5: *Chemical toys (sets) other than experimental sets*
- Part 6: *Graphical symbol for age warning labelling*
- Part 7: *Finger paints – Requirements and test methods*
- Part 8: *Swings, slides and similar activity toys for indoor and outdoor family domestic use*
- Part 9: *Organic chemical compounds – Requirements*
- Part 10: *Organic chemical compounds – Sample preparation and extraction*
- Part 11: *Organic chemical compounds – Methods of analysis*

NOTE In addition to the above parts of EN 71, the following guidance documents have been published: CEN Report, CR 14379:2002, *Classification of toys - Guidelines*, CEN Technical Report CEN/TR 15071:2005, *Safety of toys - National translations of warnings and instructions for use in EN 71*.

Introduction

This European Standard EN 71-4 is intended to reduce the risks which may present health hazards to a child when the experimental sets are used as intended or in a foreseeable way, bearing in mind the normal behaviour of children.

During use of these experimental sets, the hazards should be kept to a minimum by the provision of appropriate information to make the experiments safe and controllable. Warning phrases and instructions for use are required for experimental sets according to this European Standard.

As a general rule, toys are designed and manufactured for particular ages of children. Their characteristics are related to the age and stage of development of the children, and their use presupposes certain aptitudes. Therefore age requirements are given.

The requirements of this European Standard do not release parents or carers from their responsibility of watching over the child while he or she is playing. On the contrary, these sets require close supervision by adults.

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SIST EN 71-4:2009

<https://standards.iteh.ai/catalog/standards/sist/9d4b1b8d-3bb3-4526-bbcc-b607978bf03a/sist-en-71-4-2009>

1 Scope

This part of the European Standard EN 71 specifies requirements for the maximum amount of certain substances and preparations used in experimental sets for chemistry and related activities.

These substances and preparations are

- chemicals classified as dangerous by the Directives on dangerous substances [1] and dangerous preparations [2] (including substances which have been self-classified according to the requirements of these Directives),
- substances and preparations which in excessive amounts may harm the health of the children using them but which are not classified as dangerous by the above mentioned Directives and
- any other chemical substances and preparations delivered with the toy.

This standard applies to *chemistry sets* and *supplementary sets*. It also covers toys for experiments within the fields of mineralogy, biology, physics, microscopy and environmental science whenever they contain one or more chemical substances and/or preparations.

It also specifies requirements for marking, contents list, instructions for use and for equipment intended for carrying out the experiments.

Other chemical toys are specified in EN 71-5.

NOTE The terms “substance” and “preparation” as used in directives 67/548/EEC [1] and 1999/45/EC [2] are also used in the “REACH Regulation” Regulation (EC) No 1907/2006 [4]. This latter regulation requires also that account be taken of the emerging international standards in the regulation of chemicals such as the Globally Harmonised System (GHS) of classification and labelling of chemicals. The EU has now proposed a timetable for the introduction of GHS and it is expected that the above two mentioned directives will be repealed on 1 June 2015.

In the GHS regulation the term 'mixtures' rather than 'preparation' is used. Preparations and mixtures should be considered synonymous; both are mixtures or solutions of substances that do not react with each other.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 71-1, *Safety of toys - Part 1: Mechanical and physical properties*

EN ISO 868, *Plastics and ebonite – Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868:2003)*

EN ISO 8317, *Child-resistant packaging – Requirements and testing procedures for reclosable packages (ISO 8317:2003)*

ISO 7619, *Rubber, vulcanized or thermoplastic – Determination of indentation hardness*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

prEN 71-4:2009 (E)

3.1 chemistry set
toy consisting of one or more chemical substances and/or preparations with or without equipment intended for carrying out chemical experiments

NOTE The definition also covers toys for experiments within the fields of mineralogy, biology, physics, microscopics and environmental sciences whenever they contain one or more chemical substances and/or preparations.

3.2 supplementary set
chemistry set which is intended to be used with a complete *chemistry set*

4 Chemical substances

Only chemical substances, preparations and indicators given in Table 1 and Table 2 may be supplied in *chemistry sets* up to the amounts stated.

NOTE The quality of the chemicals used should be appropriate for the experiments described; in particular the chemicals should not contain impurities or substances which allow undefined and dangerous reactions.

Where experiments contained in the instructions of a set require it, denatured methylated spirits may be prescribed in the instructions. Also the reagents listed in Table 3 may be prescribed in the instructions at concentrations not exceeding those specified in this table. The substances specified in Table 3 shall not be provided with the *chemistry set*. The instructions for use may prescribe the use of other substances, e.g. sugar, that are not classified as dangerous substances [1] or preparations that are not classified as dangerous preparations [2]. Other substances shall not be supplied with the toy.

The chemical substances and preparations listed in Table 1, in so far as they are classified as dangerous within the definitions contained in the above Directives, shall have their containers labelled accordingly (see 6.2).

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<https://standards.iteh.ai/catalog/standards/sist/9d4b1b8d-3bb3-4526-bbcc-b607978bf03a/sist-en-71-4-2009>

Table 1 — Maximum amounts of chemical substances and preparations and labelling

Chemical substances/ preparation ^a	Max. amount per set	Danger symbol(s) (see Figure 1)	CAS number ^b	EINECS number ^b
Aluminium potassium sulfate	10 g	–	10043-67-1	233-141-3
Ammonium carbonate ^c	5 g	Xn	10361-29-2	233-786-0
Ammonium chloride	30 g	Xn	12125-02-9	235-186-4
Ammonium iron (III) sulfate ^c	5 g	Xi	10138-04-2	233-382-4
Ammonium sodium hydrogen phosphate	5 g	–	13011-54-6	235-860-8
Calcium carbonate ^c	100 g	Xi	471-34-1	207-439-9
Calcium chloride	10 g	Xi	10043-52-4	233-140-8
Calcium hydroxide ^{c,d}	20 g	Xi	1305-62-0	215-137-3
Calcium nitrate ^c	5 g	Xi, O	10124-37-5	233-332-1
Calcium oxide ^{c, d}	10 g	C	1305-78-8	215-138-9
Calcium sulfate	100 g	–	7778-18-9	231-900-3
Charcoal ^e	100 g	–	7440-44-0	231-153-3
Citric acid ^c	20 g	Xi	77-92-9	201-069-1
Clove oil ^{c, e, f}	10 ml	Xn	84961-50-2	284-638-7
Copper sheet	100 g	–	7440-50-8	231-159-6
Copper (II) oxide ^c	10 g	Xn	1317-38-0	215-269-1
Copper (II) sulfate	15 g	Xn, N	7758-98-7	231-847-6
Disodium disulfite	10 g	Xn	7681-57-4	231-548-0
Glycerol (containing at least 15 % water)	25 g	–	56-81-5	200-289-5
Hexamethylene-tetramine ^e (solid fuel)	10 g	Xn, F	100-97-0	202-905-8
Iron fillings/iron powder ^{c, e}	100 g	F	7439-89-6	231-096-4
Iron (III) chloride ^c	10 g	Xn	7705-08-0	231-729-4
Iron (II) sulfate ^c	10 g	Xn	7720-78-7	231-753-5
Lactose	100 g	–	63-42-3	200-559-2
Lead-free solder	100 g	–	–	–
Magnesium strip ^c	3 g	F	7439-95-4	231-104-6
Magnesium sulfate	25 g	–	7487-88-9	231-298-2
Manganese (IV) dioxide	5 g	Xn	1313-13-9	215-202-6

Table 1 (continued)

Chemical substances/ preparation ^a	Max. amount per set	Danger symbol(s) (see Figure 1)	CAS number ^b	EINECS number ^b
Manganese (II) sulfate	15 g	Xn, N	7785-87-7	232-089-9
Ninhydrin ^c	1 g	Xn	485-47-2	207-618-1
Pepsin A	10 g	Xn	9001-75-6	232-629-3
Potassium bromide ^c	15 g	Xi	7758-02-3	231-830-3
Potassium hexacyanoferrate (III) ^e	10 g	-	13746-66-2	237-323-3
Potassium hexacyanoferrate (II) ^e	10 g	-	13943-58-3	237-722-2
Potassium iodide	10 g	-	7681-11-0	231-659-4
Potassium permanganate ^g	15 g	Xn, O, N	7722-64-7	231-760-3
Potassium permanganate: sodium sulphate mixture (1:2) (m/m)	10 g	Xn, O, N	-	-
Silver nitrate ^c (1 % (m/V) aqueous solution)	10 ml	Xi ^h , N ^h	7761-88-8	231-853-9
Sodium acetate	20 g	-	127-09-3	204-823-8
Sodium carbonate	50 g	Xi	497-19-8	207-838-8
Sodium chloride	100 g	-	7647-14-5	231-598-3
Sodium hydrogen carbonate	50 g	-	144-55-8	205-633-8
Sodium hydrogen sulphate	30 g	Xi	7681-38-1	231-665-7
Sodium silicate solution (SiO ₂ :Na ₂ O > 2) ^c	100 ml	C	-	-
Sodium sulfate	100 g	-	7757-82-6	231-820-9
Sodium thiosulfate	50 g	-	7772-98-7	231-867-5
Sulfur ^c	15 g	F	7704-34-9	231-722-6
Tannin ^e	15 g	-	1401-55-4	215-753-2
Tartaric acid ^c	20 g	Xi	87-69-4	201-766-0
Tin (II) chloride ^c	15 g	C	7772-99-8	231-868-0
Tincture of iodine ^e (2,5 % m/V ethanolic solution) ⁱ	10 ml	Xn ^j , N ^j , F	-	-
Urea ^e	10 g	-	57-13-6	200-315-5

Table 1 (continued)

Chemical substances/preparation ^a	Max. amount per set	Danger symbol(s) (see Figure 1)	CAS number ^b	EINECS number ^b
Zinc powder / zinc pellets	20 g	F, N	7440-66-6	231-175-3
Zinc sulfate (heptahydrate)	20 g	Xn, N	7446-20-0	231-793-3

^a The substances and preparations in Table 1 are listed in alphabetical order and may therefore be placed in different positions in the national translations.

^b Chemical Abstract Service (CAS) registry number and European Inventory of Existing Chemical Substances (EINECS) number are provided for information purposes only.

^c The classifications of the substances correspond to the most stringent self-classifications according to manufacturer's literature.

^d Only one of these substances shall be provided per set.

^e The chemical nomenclature is mainly based on IUPAC with the exceptions of the substances marked.

^f The following R- and S-phrases shall be given:
Clove oil: Risk phrase: R43 May cause sensitization by skin contact
Safety advice phrase: S24 Avoid contact with skin.

^g Only to be provided in sets intended for children over the age of 12 years.

^h Xi and N apply to silver nitrate not its 1 % (m/V) aqueous solution.

ⁱ Denatured alcohol (ethanol)

^j Xn and N apply to iodine, not to its ethanolic solution.

If indicators are supplied as solution, their solid contents shall not exceed the amounts specified in Table 2.

NOTE Non-bleeding indicators in books, pads or rolls are far below toxicological levels of concern and may be supplied without any amount-limitations for indicators.