SLOVENSKI STANDARD
oSIST prEN 71-4:2011

01-julij-2011

Varnost igrač - 4. del: Kompleti za kemijske poskuse in druge poskuse, pri katerih se uporabljajo kemikalije

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

Sicherheit von Spielzeug - Teil 4: Experimentierkästen für chemische und ähnliche Versuche

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

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 71-4:2013
https://standards.iteh.ai/catalog/standards/sist/ed272d0e-9e5c-4432-87e7-0805e31feddf/sist-en-71-4-2013

Ta slovenski standard je istoveten z: **prEN 71-4 rev**

ICS:

97.200.50 Igrače Toys

oSIST prEN 71-4:2011 **en,fr,de**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 71-4:2013
https://standards.iteh.ai/catalog/standards/sist/ed372d0e-9c5c-4432-87e7-6803c311eddf/sist-en-71-4-2013

oSIST prEN 71-4:2011

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 71-4 rev

June 2011

ICS 97.200.50

Will supersede EN 71-4:2009

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 - Teil 4: Experimentierkästen für chemische und ähnliche Versuche

This draft European Standard is submitted to CEN members for enquiry. 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.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

iTeh STANDARD PREVIEW

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

https://standards.iteh.ai/catalog/standards/sist/ed372d0e-9c5c-4432-87e7-

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

© 2011 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. prEN 71-4 rev:2011: E

oSIST prEN 71-4:2011

Contents

Page

iTeh STANDARD PREVIEW
(standards.iteh.ai)
https://standards.iteh.ai/catalog/standards/sist/ed372d0e-9c5c-4432-87e7-

oSIST prEN 71-4:2011

Foreword

This document (prEN 71-4:2011) 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 CEN Enquiry.

This document will supersede EN 71-4:2009.

This document 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, see informative Annex ZA, which is an integral part of this document.

The significant changes from the previous edition of this standard are detailed in Annex D.

This standard is part 4 of a series of standards for the safety of toys.

This Part 4 of the EN 71 series shall be read in conjunction with EN 71 Part 1.

EN 71, *Safety of toys*, consists of the following parts:

iTeh STANDARD PREVIEW
(standards.iteh.ai)

- *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 7: Finger paints – Requirements and test methods*
- *Part 8: Activity toys for 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*

SIST EN 71-4:2013
https://standards.iteh.ai/catalog/standards/sist/ed372d0e-9c5c-4432-87e7-ba05c311eddf/sist-en-71-4-2013

NOTE 1 In addition to the above parts of EN 71, the following guidance documents have been published: CEN Report, CR 14379, *Classification of toys - Guidelines*, CEN Technical Report CEN/TR 15071, *Safety of toys - National translations of warnings and instructions for use in EN 71, and CEN Technical Report CEN/TR 15371, Safety of toys – Replies to requests for interpretation of EN 71-1, EN 71-2, and EN 71-8*.

NOTE 2 Words in *italics* are defined in Clause 3 (Terms and definitions).

oSIST prEN 71-4:2011

Introduction

This European Standard EN 71-4 is intended to reduce the risks and health hazards to a child when *experimental sets* involving chemical experiments are used as intended or in a foreseeable way, bearing in mind the 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, *experimental sets* 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 carrying out experiments. On the contrary, the use of these sets requires close supervision by adults.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 71-4:2013
https://standards.iteh.ai/catalog/standards/sist/ed372d0e-9c5c-4432-87e7-6803c311eddf/sist-en-71-4-2013

oSIST prEN 71-4:2011

1 Scope

This European Standard specifies requirements for the maximum amount and, in some cases, the maximum concentration of certain substances and mixtures used in *experimental sets* for chemistry and related activities.

These substances and mixtures are:

— those classified as dangerous by the EC-legislation applying to dangerous substances [1], [2] and dangerous mixtures [2], [3];

— substances and mixtures which in excessive amounts could harm the health of the children using them and which are not classified as dangerous by the above mentioned legislation; and

— any other chemical substance(s) and mixture(s) delivered with the *experimental set*.

This standard applies to *experimental sets* for chemistry and related activities including *crystal growing sets*, *carbon dioxide generating experimental sets* and *supplementary sets*. It also covers sets for chemical experiments within the fields of mineralogy, biology, physics, microscopy and environmental science whenever they contain one or more chemical substances and/or mixtures which are classified as hazardous according to Regulation (EC) No. 1272/2008/EC [2].

This standard also specifies requirements for marking, a contents list, instructions for use, eye protection and for the equipment intended for carrying out the experiments.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Requirements for other *chemical toys* are given in EN 71-5.

NOTE The terms “substance“ and “preparation“, as used in Directives 67/548/EEC [1] and 1999/45/EC [3], are also used in the “REACH Regulation”, Regulation (EC) No. 1907/2006 [4]. According to the Globally Harmonised System (GHS) of classification and labelling of chemicals, which in the European Union has been enacted by Regulation (EC) No. 1272/2008 (classification, labelling and packaging of substances and mixtures) [2], the timetable for the introduction of GHS has to be followed.

SIST EN 71-4:2013
https://standards.iteh.ai/catalog/standards/sist/ed572d0e-93c-4452-87e7-6803c311eddf/sist-en-71-4-2013

The words “preparation” and “mixture” should be considered synonymous; both are a mixture or solution of substances that do not react with each other. The old term “preparation” will be replaced by the new term “mixture” in due course. In this standard only the term “mixture” is used.

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 862, *Packaging - Child-resistant packaging - Requirements and testing procedures for non-reclosable packages for non-pharmaceutical products*

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*

oSIST prEN 71-4:2011

3 Terms and definitions

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

3.1
chemical toy
toy intended for the direct handling of chemical substances and mixtures and which is used in a manner appropriate to a given age-group and under the supervision of an adult

3.2
experimental set
chemical toy where the experimental and explorative character in playing with single chemical substances and mixtures along strict instructions dominates over the creative ideas of the user

3.3
chemistry set
experimental set consisting of one or more chemical substances and/or mixtures with or without equipment intended for carrying out chemical experiments

NOTE The definition also covers *experimental sets* for chemical experiments within the fields of mineralogy, biology, physics, microscopy and environmental sciences whenever they contain one or more chemical substances and/or mixtures which are classified as hazardous according to Regulation 1272/2008/EC,excluding *crystal growing sets* and *carbon dioxide generating experimental sets*.

3.4
crystal growing set
experimental set consisting of one or more chemical substances for growing crystals without any reaction between the supplied substances

NOTE A *carbon dioxide generating experimental set* is used to grow crystals of different substances in aqueous solutions. The crystals may be grown on different materials (e.g. stones or gypsum) and can be coloured in different ways (e.g. with food colours): The expanding nature of the growing crystal is not subject to requirements within EN 71 -1 for expanding materials as the expansion is not related to the absorption of water in the crystal and the expansion usually takes place over a long period of time (several days or weeks).

3.5
carbon dioxide generating experimental set
experimental set consisting mainly of a carbon dioxide-donor substance or mixture and a carbon dioxide-liberating substance or mixture which after combination generate carbon dioxide in the presence of water in an open system without any gas-tight restriction or confinement

NOTE The set is used to carry out and observe chemical reactions where there is no intention to generate carbon dioxide in order to demonstrate speed, velocity or noise.

3.6
supplementary set
incomplete *experimental set* which is intended to be used with a complete *experimental set*

4 Chemical substances in experimental sets

4.1 Chemistry sets

Only the chemical substances, mixtures and indicators given in Table 1 and Table 2 may be supplied in *chemistry sets* or in a *supplementary set* for a *chemistry set* up to the amounts and concentrations specified in those tables.

NOTE 1 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 to occur.

oSIST prEN 71-4:2011

Apart from its presence in tincture of iodine, denatured alcohol (ethanol) shall not be supplied in a *chemistry set*. However, where experiments contained in the instructions of a *chemistry set* require it, the use of denatured methylated spirits may be suggested in the instructions.

The use of reagents listed in Table 3 may be suggested in the instructions at concentrations not exceeding those specified in this table. The substances specified in Table 3 shall not be supplied in a *chemistry set*.

The instructions for use may suggest the use of other substances that are not classified as dangerous substances [1], [2] (e.g. sucrose or table sugar) or mixtures that are not classified as dangerous mixtures [2], [3]. Other substances shall not be supplied with the set.

The substances and mixtures in a *chemistry set* or in a *supplementary set* of a *chemistry set* shall be supplied in containers which are provided with closures (see 5.2.4.1).

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

Chemical substances/ mixture[a]	**Max. amount per set**	**GHS Pictograms (see Figure 1)**	**Signal word**	**CAS number**	**EINECS number**	**INDEX number**
Aluminium potassium sulphate	10 g	–	–	10043-67-1	233-141-3	–
Ammonium carbonate	5 g	GHS07	Warning	10361-29-2	233-786-0	–
Ammonium chloride	30 g	GHS07	Warning	12125-02-9	235-186-4	017-014-00-8
Ammonium iron (III) sulfate	5 g	GHS07	Warning	10138-04-2	233-382-4	–
Ammonium sodium hydrogen phosphate	5 g	–	–	13011-54-6	235-860-8	–
Calcium carbonate	100 g	GHS07	Warning	471-34-1	207-439-9	–
Calcium chloride	10 g	GHS07	Warning	10043-52-4	233-140-8	017-013-00-2
Calcium hydroxide[b]	20 g	GHS05	Danger	1305-62-0	215-137-3	–
Calcium nitrate	5 g	GHS03, GHS07	Warning	10124-37-5	233-332-1	–
Calcium oxide[b]	10 g	GHS05	Danger	1305-78-8	215-138-9	–
Calcium sulphate	100 g	–	–	7778-18-9	231-900-3	–
Charcoal[c]	100 g	–	–	7440-44-0	231-153-3	–
Citric acid	20 g	GHS05	Danger	77-92-9	201-069-1	–
Copper sheet	100 g	–	–	7440-50-8	231-159-6	–
Copper (II) oxide	10 g	GHS07	Warning	1317-38-0	215-269-1	–
Copper (II) sulfate	15 g	GHS07, GHS09	Warning	7758-98-7	231-847-6	029-004-00-0
Disodium disulfite	10 g	GHS05, GHS07	Danger	7681-57-4	231-673-0	016-063-00-2
Glycerol (containing at least 15 % water)	25 g	–	–	56-81-5	200-289-5	–

Table 1 *(continued)*

Chemical substances/ mixture[a]	**Max. amount per set**	**GHS Pictograms (see Figure 1)**	**Signal word**	**CAS number**	**EINECS number**	**INDEX number**
Hexamethylene-tetramine[c] (solid fuel)	10 g	GHS02, GHS08	Warning	100-97-0	202-905-8	612-101-00-2
Iron fillings/iron powder, [c]	100 g	GHS02	Warning	7439-89-6	231-096-4	–
Iron (III) chloride	10 g	GHS05, GHS07	Danger	7705-08-0	231-729-4	–
Iron (II) sulfate	10 g	GHS07	Warning	7720-78-7	231-753-5	026-003-00-7
Lactose	100 g	–	–	63-42-3	200-559-2	–
Lead-free solder	100 g	–	–	–	–	–
Magnesium strip	3 g	GHS02	Warning	–	–	–
Magnesium sulfate	25 g	–	–	7487-88-9	231-298-2	–
Manganese (IV) dioxide	5 g	GHS07	Warning	1313-13-9	215-202-6	025-001-00-3
Manganese (II) sulfate	15 g	GHS08, GHS09	Warning	7785-87-7	232-089-9	025-003-00-4
Ninhydrin	1 g	GHS07	Warning	485-47-2	207-618-1	–
Pepsin A	10 g	GHS07, GHS08	Danger	9001-75-6	232-629-3	647-008-00-6
Potassium bromide	15 g	GHS07	Warning	7758-02-3	231-830-3	–
Potassium hexacyanoferrate (III)[c]	10 g	–	–	13746-66-2	237-323-3	–
Potassium hexacyanoferrate (II)[c]	10 g	–	–	13943-58-3	237-722-2	–
Potassium iodide	10 g	–	–	7681-11-0	231-659-4	–
Potassium permanganate[d]	15 g	GHS03, GHS07, GHS09	Danger	7722-64-7	231-760-3	025-002-00-9
Potassium permanganate: sodium sulphate mixture (1:2) (mass fraction)	10 g	GHS03, GHS07, GHS09	Danger	–	–	–
Silver nitrate (1 % (*m/V*) aqueous solution)	10 ml	GHS07[e], GHS09[e]	Warning	7761-88-8	231-853-9	047-001-00-2
Sodium acetate	20 g	–	–	127-09-3	204-823-8	–
Sodium carbonate	50 g	GHS07	Warning	497-19-8	207-838-8	011-005-00-2

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 71-4:2013
https://standards.iteh.ai/catalog/standards/sist/ed1372d0a-9c3c-4432-87e7-68036311eddf/sist-en-71-4-2013

oSIST prEN 71-4:2011

Table 1 *(continued)*

Chemical substances/ mixture[a]	**Max. amount per set**	**GHS Pictograms (see Figure 1)**	**Signal word**	**CAS number**	**EINECS number**	**INDEX number**
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	GHS05	Danger	7681-38-1	231-665-7	016-046-00-X
Sodium silicate solution (SiO_2:Na_2O > 2)	100 ml	GHS05	Danger	–	–	–
Sodium sulfate	100 g	–	–	7757-82-6	231-820-9	–
Sodium thiosulfate	50 g	–	–	7772-98-7	231-867-5	–
Sulfur	15 g	GHS07	Warning	7704-34-9	231-722-6	016-094-00-1
Tannin	15 g	–	–	1401-55-4	215-753-2	–
Tartaric acid	20 g	GHS07	Warning	87-69-4	201-766-0	–
Tin (II) chloride	15 g	GHS07	Warning	7772-99-8	231-868-0	–
Tincture of iodine[c] (2,5 % (*m/V*) ethanolic solution)[f]	10 ml	GHS02, GHS07[g], GHS09[g]	Warning	–	–	–
Urea[c]	10 g	–	–	57-13-6	200-315-5	–
Zinc powder (stabilized) / zinc pellets	20 g	GHS09	Warning	7440-66-6	231-175-3	030-001-01-9
Zinc sulfate (heptahydrate)	20 g	GHS05, GHS07, GHS09	Danger	7446-20-0	231-793-3	–

NOTE If not mentioned otherwise, the maximum amounts of the solid substances in Table 1 refer to the anhydrous chemicals. Equivalent amounts of the hydrated chemicals may replace the anhydrous substances.

[a] The substances and mixtures in Table 1 are listed in alphabetical order and may therefore be placed in different positions in non-English versions of this standard.

[b] Only one of these substances shall be provided in each set.

[c] Generally, IUPAC chemical nomenclature is used with the exceptions of these substances.

[d] Only to be provided in *chemistry sets* intended for children over the age of 12 years.

[e] Strictly speaking, at the time of publication, GHS07 and GHS09 apply to a 5-10 % (*m/V*) aqueous solution of silver nitrate and not a 1 % (*m/V*) aqueous solution of silver nitrate; see Annex B for the rationale for specifying this classification.

[f] Denatured alcohol (ethanol)

[g] Strictly speaking, at the time of publication, the GHS pictograms GHS07 and GHS09 apply to iodine, not to a 2,5 % ethanolic solution of iodine; see Annex B for the rationale of specifying this classification.

iTeh STANDARD PREVIEW (standards.iteh.ai) SIST EN 71-4:2013 https://standards.iteh.ai/catalog/standards/sist/ed372d0e-9... 6f03e311eddf/sist-en-71-4-2013

oSIST prEN 71-4:2011

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

NOTE 2 Non-bleeding indicators in books, pads or rolls are not of toxicological concern and may be supplied without any quantity limitations for the relevant indicator(s).

Table 2 — Maximum amounts and concentrations of indicators and labelling

Chemical substances/ mixture[a]	Max. amount per set	GHS Pictograms (see Figure 1)	Signal word	CAS number	EINECS number	INDEX number
Eosin	1 g	GHS07	Warning	17372-87-1	241-409-6	–
Iodine (2,5 % (*m/V*) in a 2,5 % (*m/V*) aqueous solution of potassium iodide)	10 ml	GHS07[b] , GHS09[b]	Warning	7553-56-2	231-442-4	053-001-00-3
Litmus blue	1 g	–	–	–	–	–
Litmus red	1 g	–	–	1393-92-6	215-739-6	–
Luminol[c] (5 % (mass fraction) mixture with sodium sulfate)	3 g	GHS07[d]	Warning	521-31-3	208-309-4	–
Methyl orange[c] (20 % (mass fraction) sodium sulfate mixture)	3 g	GHS06[e]	Danger	547-58-0	208-925-3	–
Methylene blue	1 g	GHS07	Warning	61-73-4	200-515-2	–
Phenol red	1 g	GHS07	Warning	143-74-8	205-609-7	–
Thymol blue	1 g	–	–	76-61-9	200-973-3	–
Bleeding universal indicator paper	1 pad	–	–	–	–	–

NOTE If not mentioned otherwise, the maximum amounts of the solid substances in Table 2 refer to the anhydrous chemicals. Equivalent amounts of the hydrated chemicals may replace the anhydrous substances.

[a] The substances and mixtures in Table 2 are listed in alphabetical order and may therefore be placed in different positions in non-English versions of this standard.

[b] Strictly speaking, at the time of publication, the GHS pictograms GHS07 and GHS09 apply to iodine, not to a 2,5% aqueous solution of iodine; see Annex B for the rationale for specifying this classification.

[c] The GHS pictogram applies to the substance and not to the mixture.

[d] Strictly speaking, at the time of publication, the GHS pictogram GHS07 applies to luminol, not to a 5 % (mass fraction) mixture of luminol with sodium sulfate; see Annex B for the rationale for specifying this classification.

[e] Strictly speaking, at the time of publication, the GHS pictogram GHS06 applies to methyl orange, not to a 20 % (mass fraction) mixture of methyl orange with sodium sulfate; see Annex B for the rationale for specifying this classification.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 71-4:2013
https://standards.iteh.ai/catalog/standards/sist/e...-9e...-...7e7-6803c311eddf/sist-en-71-4-2013