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DRAFT EAST AFRICAN STANDARD

Chlorinated lime (bleaching powder) for water treatment — Specification

EAST AFRICAN COMMUNITY

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East African Community
P.O. Box 1096,
Arusha
Tanzania
Tel: + 255 27 2162100
Fax: + 255 27 2162190
E-mail: eac@eachq.org
Web: www.eac-quality.net

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Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC 069, *Organic and Inorganic chemicals*.

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Chlorinated Lime (bleaching Powder) for water treatment — Specification

1 Scope

This Draft East African Standard specifies requirements, sampling and test methods for chlorinated lime commonly known as bleaching powder or chloride of lime.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 5961, *Water quality — Determination of cadmium by atomic absorption spectrometry*

ISO 6333, *Water quality — Determination of manganese — Formaldoxime spectrometric method*

ISO 8213, *Chemical products for industrial use – Sampling technique – Solid chemical products in the form of particles varying from powders to coarse lumps*

ISO 8288, *Water quality — Determination of cobalt, nickel, copper, zinc, cadmium and lead — Flame atomic absorption spectrometric methods*

ISO 9174, *Water quality — Determination of chromium — Atomic absorption spectrometric methods*

ISO 11969, *Water quality — Determination of arsenic — Atomic absorption spectrometric method (hydride technique)*

ISO 12846, *Water quality — Determination of mercury — Method using atomic absorption spectrometry (AAS) with and without enrichment*

ISO/TS 17379, *Water quality — Determination of selenium — Part 2: Method using hydride generation atomic absorption spectrometry (HG-AAS)*

3 Terms and definitions

No terms and definitions are listed in this document..

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Requirements

4.1 General requirements

4.1.1 Chlorinated lime (Bleaching powder) for water treatment shall be yellowish-white in colour, hygroscopic powder with bulk density of about 0.60 g/ml to 0.85 g/ml.

4.1.2 Chlorinated lime for water treatment shall be free from lumps and shall not contain any foreign material when observed visually

4.1.3 Chlorinated lime for water treatment shall be dry and free flowing.

4.2 Specific requirements

Chlorinated lime for water treatment shall comply with the specific requirements given in Table 1 when tested in accordance with the test methods specified therein.

Table 1 — Specific requirements for chlorinated lime for water treatment

S/N	Characteristic	Requirement	Test method
i.	Available chlorine content, % wt /v, min	25.0	Annex A
ii.	Moisture content, % m/m, max.	2.0	Annex B
iii.	Particle size (passing through 170-µm sieve), % m/m, min.	99.5	annex C
iv.	Stability – Maximum loss of available chlorine on heating, %m/m. max	15.0	Annex D

4.3 Heavy metal contaminants

chlorinated lime for water treatment shall comply with the heavy metal limits specified in Table 2 when tested in accordance with the test methods therein.

Table 2 — Heavy metal limits for chlorinated lime for water treatment

S/N	Heavy metal	Maximum limit ^a mg/kg	Test method
i.	Lead (as Pb)	4	ISO 8288
ii.	Arsenic (as As)	10	ISO 11969
iii.	Mercury (as Hg)	0.02	ISO 12846
iv.	Cadmium, (as Cd)	1	ISO 5961
v.	Chromium Total, (as Cr)	6	ISO 9174
vi.	Selenium, (as Se)	1	ISO/TS 17379
^a conversion from mg/l to mg/kg = $\frac{\text{mg/L}}{\text{Density in kg/L}}$			

5 Packaging

Chlorinated lime for water treatment shall be packaged in suitable well-sealed containers that shall protect the contents and shall not cause any contamination or react with the product.

6. Labelling

6.1 Each package shall be legibly and indelibly labelled in English and/or any other official language (French, Kiswahili, etc) used in the importing East African Partner State with the following information:

- a) product name as “Chlorinated lime”

Note Words such as bleaching powder or chloride of lime may be used to replace the name “Chlorinated lime”.

- b) name and physical address of the manufacturer;
- c) registered trade mark, if any;
- d) .net weight;
- e) . date of manufacture;
- f) expiry date;
- g) code or batch number;
- h) a warning that the material is a strong oxidizing agent and that contact with heat, acids, or organic or combustible material could cause fire;
- i) chemical name of the product and the percentage of available chlorine;
- j) country or origin;
- k) name of the product;
- l) indication of words like “water treatment”;
- m) storage condition;
- n) instruction for use; and
- o) disposal instructions.

6.2 The product shall also be labelled with appropriate safety symbols as specified in Globally Harmonized System of Classification and Labelling of Chemicals.”

7. Sampling

Sampling shall be done in accordance with ISO 8213.

Annex A (normative)

Determination of available Chlorine

A.1 Reagents

A.1.1 Crystalline potassium iodide (iodate free).

A.1.2 Glacial acetic acid.

A.1.3 Potassium Dichromate solution, 0.1 N, Carefully pulverize a quantity of potassium dichromate ($K_2Cr_2O_7$) and dry at $110 \pm 5^\circ C$ to constant weight. Dissolve 4.790 4 g of the dried reagent in water to make exactly 1 litre and mix thoroughly.

A.1.4 Standard Sodium Thiosulphate Solution 0.1 N

A.1.4.1 Standardization of sodium thiosulphate solution, In a 250 mL glass-stoppered flask, take 2 g of potassium iodide and about 25 ml water to dissolve it. Then add approximately 2 g of sodium bicarbonate and 5 ml of hydrochloric acid. Just before the effervescence dies down, add 25 ml of 0.1 N potassium dichromate solution. When the effervescence ceases, stopper the flask and allow to stand for 10 min. in a cool dry place.

A.1.4.2 Dilute with 50 ml of water and titrate against standard sodium thiosulphate solution till the liquid in the flask has assumed a yellowish green colour. Then add starch solution and continue with the addition of sodium thiosulphate solution until the blue colour is just discharged.

A.1.5 Starch indicator, Titrate 1 g of starch with 10 ml of cold water and pour, with constant stirring, into 200 ml of boiling water. Allow to settle and use the clear supernatant liquid.

A.2 Procedure

A.2.1 Weigh accurately about 2.5 g of the sample and grind in a mortar with water till a smooth paste is formed. Add 15 ml to 25 ml of water and decant off the fine part into a 250 ml flask. Again grind the material left behind and repeat the process of decanting off till no gritty material is left. Wash the pestle and mortar in the same flask. Make the solution to 250 ml.

A.2.2 Take 25 ml of the solution, add 2 g of potassium iodide crystals and 100 ml of water and then add 2 ml of glacial acetic acid and titrate it against the standardized sodium thiosulphate solution till the pale yellow colour is left. At this stage add starch indicator and continue the addition of standard sodium thiosulphate solution till the blue colour changes.

A3. CALCULATION

$$\text{Available chlorine, per cent by weight} = \frac{A \times N \times 35.453 \times 20 \times 100}{W}$$

where,

A volume in ml of standard sodium thiosulphate solution used,

N normality of standard sodium thiosulphate solution, and

W weight in g of sample taken for the test

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Annex B

(normative)

Determination of moisture content

B1. Procedure

Weigh accurately 15 g – 20 g of the sample in an open, dry weighing glass and place it for 24 h in a vacuum desiccator over fused anhydrous calcium chloride, under an absolute pressure of 30 mm – 40 mm of mercury. Weigh the weighing glass again. The decrease in weight corresponds to the moisture content of the sample.

B2. Calculation

$$\text{Moisture content, per cent by weight} = \frac{W_2}{W_1} \times 100$$

where

W_1 weight of material taken before drying, and

W_2 weight of material after drying.

Annex C

(normative)

Determination of particle size

C.1 Procedure

Weigh, to the nearest 0.1 g, approximately 50 g of the sample and place it on the relevant sieve conforming to CS 124. Shake the sieve till no more material passes through it and weigh the material passing through the sieve.

C.2 Calculation

Material passing through the sieve, per cent by mass = $\frac{M_1}{M_0} \times 100$

where

m_0 mass, in g, of the sample used; and

m_1 mass, in g, of the sample passing through the sieve.

Annex D (normative)

Determination of loss of available chlorine on heating

D.1 Procedure

Weigh to the nearest 0.001 g, approximately 25 g of the sample in a 75 mm evaporating dish. Place the dish on a steam bath at $100 \pm 2^{\circ}\text{C}$ for 2 h. Cover with a watch glass and allow to cool to room temperature. Transfer the material to a porcelain mortar and proceed from this point with the determination of available chlorine as described in **A2** of annex A.

D.2 Calculation

Calculate the per cent available chlorine of the heated sample as given in **A3** of Annex A.

Loss of available chlorine, on the basis of initial available chlorine, per cent by mass

$$\text{Percent insoluble} = \frac{B}{A} \times 100$$

where

A per cent by mass, of initial available chlorine obtained without heating, and

B per cent by mass, of available chlorine after heating

Bibliography

- [1] KS 1290:3:1998, *Specification for bleaching agents —Part 3: Chlorinated Lime (Bleaching Powder) for Water Treatment*
- [2] TZS 784: 2023, Chemicals used for treatment of water intended for human consumption — Sodium hypochlorite

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