INTERNATIONAL STANDARD 1689

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Sodium and potassium silicates for industrial use — Calculation of the ratio $\frac{SiO_2}{Na_2O}$ or $\frac{SiO_2}{K_2O}$

Silicates de sodium et de potassium à usage industriel — Calcul du rapport $\frac{SiO_2}{Na_2O}$ *ou* $\frac{SiO_2}{K_2O}$

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Descriptors : sodium silicates, potassium silicates, chemical analysis, determination of content, ratios, silicon dioxide, sodium oxide, potassium oxide

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 47 has reviewed ISO Recommendation R 1689 and found it technically suitable for transformation. International Standard ISO 1689 therefore replaces ISO Recommendation R 1689-1970 to which it is technically identical.

ISO Recommendation R 1689 was approved by the Member Bodies of the following countries :

Australia	India	Romania
Austria	Iran	South Africa, Rep. of
Belgium	Israel	Spain
Brazil	Italy	Switzerland
Czechoslovakia	Japan	Thailand
Egypt, Arab Rep. of	Netherlands	Turkey
France	New Zealand	U.S.S.R.
Germany	Peru	Yugoslavia
Greece	Poland	
Hungary	Portugal	

The Member Body of the following country expressed disapproval of the Recommendation on technical grounds :

United Kingdom

The Member Body of the following country disapproved the transformation of ISO/R 1689 into an International Standard :

United Kingdom

Printed in Switzerland

Sodium and potassium silicates for industrial use — Calculation of the ratio $\frac{SiO_2}{Na_2O}$ or $\frac{SiO_2}{K_2O}$

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the formula for the calculation of the ratio $\frac{SiO_2}{Na_2O}$ or $\frac{SiO_2}{K_2O}$ for sodium silicates and potassium silicates for industrial use, respectively.

In this ratio, only the Na_2O or the K_2O combined in the form of silicates is considered.

2 REFERENCES

ISO 1690, *Sodium and potassium silicates for industrial use — Determination of silica content — Gravimetric method by insolubilization.*

ISO 1691, *Sodium and potassium silicates for industrial use — Determination of carbonate content — Gas-volumetric method.*

ISO 1692, *Sodium and potassium silicates for industrial use — Determination of total alkalinity — Titrimetric method.*

3 SODIUM SILICATES

a = total alkalinity, expressed in Na_2O, % (*m/m*) (see ISO 1692)

b = silica (SiO_2), % (*m/m*) (see ISO 1690)

c = sodium carbonate (Na_2CO_3), % (*m/m*) (see ISO 1691)

d = Na_2O combined in the carbonate form, % (*m/m*) $= c \times \frac{62}{106} = 0{,}585\,c$

e = Na_2O combined in the silicate form, % (*m/m*) $= a - d = a - 0{,}585\,c$

f = ratio by mass $\frac{SiO_2}{Na_2O} = \frac{b}{e} = \frac{b}{a - 0{,}585\,c}$

g = molar ratio $\frac{SiO_2}{Na_2O} = f \times 1{,}032$

4 POTASSIUM SILICATES

a = total alkalinity, expressed in K_2O, % (*m/m*) (see ISO 1692)

b = silica (SiO_2), % (*m/m*) (see ISO 1690)

c = potassium carbonate (K_2CO_3), % (*m/m*) (see ISO 1691)

d = K_2O combined in the carbonate form, % (*m/m*) $= c \times \frac{94{,}2}{138{,}2} = 0{,}682\,c$

e = K_2O combined in the silicate form, % (*m/m*) $= a - d = a - 0{,}682\,c$

f = ratio by mass $\frac{SiO_2}{K_2O} = \frac{b}{e} = \frac{b}{a - 0{,}682\,c}$

g = molar ratio $\frac{SiO_2}{K_2O} = f \times 1{,}568$

5 TEST REPORT

The test report shall include the following particulars :

a) the reference of the methods used for the determination and for the calculation;

b) the results, and the method of expression used;

c) any unusual features noted during the determinations;

d) any operations not included in this International Standard or the International Standards to which reference is made, or regarded as optional.

ANNEX

ISO PUBLICATIONS RELATING TO SODIUM AND POTASSIUM SILICATES FOR INDUSTRIAL USE

ISO 1686 – Samples and methods of test – General.

ISO 1687 – Determination of density at 20 °C of samples in solution – Method using density hydrometer and method using pyknometer.

ISO 1688 – Determination of dry matter – Gravimetric method.

ISO 1689 – Calculation of the ratio $\frac{SiO_2}{Na_2O}$ or $\frac{SiO_2}{K_2O}$.

ISO 1690 – Determination of silica content – Gravimetric method by insolubilization.

ISO 1691 – Determination of carbonate content – Gas-volumetric method.

ISO 1692 – Determination of total alkalinity – Titrimetric method.

ISO 2122 – Preparation of solution of products not easily soluble in boiling water and determination of matter insoluble in water.

ISO 2123 – Determination of dynamic viscosity.

ISO 2124 – Determination of silica content – Titrimetric method.

ISO 3200 – Determination of sulphate content – Barium sulphate gravimetric method.

ISO 3201 – Determination of iron content – 1,10-Phenanthroline photometric method.