BRITISH STANDARD

BS 4583:1991

Methods of test for

Higher alcohols for industrial use

Confirmed
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Committees responsible for this British Standard

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British Pharmacopoeia Commission
British Society of Perfumers
Chemical Industries' Association
Ministry of Defence
Oil and Colour Chemists Association
Royal Society of Chemistry
Solvents Industry Association Ltd.

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Contents

Foreword

This British Standard has been prepared under the direction of the Chemicals Standards Policy Committee and provides a comprehensive series of test methods for C_6 to C_{13} alcohols for industrial use.

This revision supersedes BS 4583:1970, which is withdrawn.

The principal differences between this standard and the 1970 edition are as follows.

a) The scope has been extended to include C_6 alcohols.

b) General test methods are now specified for the measurement of colour (see BS 5339) and the determination of distillation characteristics (see BS 4591).

c) For the determination of ash (see clause **7**), the heating in a furnace is carried out at a temperature of 600 ± 30 °C instead of 630 ± 30 °C.

d) Acidity is now expressed as a percentage by mass of acetic acid instead of milliequivalents per kilogram.

e) Aldehydes and ketones are now determined by titrating the liberated hydrochloric acid, from the reaction with hydroxylammonium chloride, with ethanolic potassium hydroxide solution (see clause **9**).

f) For the measurement of colour after treatment with sulphuric acid (see clause **10**), the reaction vessel is now cooled in an ice-water bath before, during and immediately after the addition of the sulphuric acid solution.

g) For the determination of total alcohols content (see clause **11**), acetic anhydride is used for the esterification, instead of phthalic anhydride, and the results are now expressed as a percentage by mass.

h) The determination of bromine number (see clause **12**) has been added.

In preparing this standard, account has been taken of Parts 1 to 8 of ISO 1843 "*Higher alcohols for industrial use — Methods of test*", published by the International Organization for Standardization (ISO). Appendix A gives the relationship between international standards and this British Standard, together with the relationship between general test methods and corresponding international standards.

This standard describes methods of test only and should not be used or quoted as a specification defining limits of purity. Reference to this standard should indicate that the methods of test used are in accordance with the appropriate clauses of BS 4583:1991.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard describes methods for testing C_6 to C_{13} alcohols for industrial use.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Sampling[1)]

Store the laboratory sample in a clean, dry and airtight, ground glass stoppered bottle, or a screw-capped bottle fitted with a polyethylene cone insert, of such capacity that it is almost filled by the sample. Sufficient ullage should be left in the bottle to avoid excessive pressure changes that could arise from temperature variations during storage and handling. About 10 % ullage is recommended. If it necessary to seal the bottle, take care to avoid any risk of contamination of the contents. Store the sample in a cool place in the dark.

3 Measurement of colour

Determine the colour by the method described in BS 5339.

4 Determination of density at 20 °C

Determine the density at 20 °C by the method described in BS 4522.

5 Determination of distillation characteristics

Determine the distillation characteristics by the method described in BS 4591, except that the following thermometer, distillation conditions and temperature corrections shall be used.

a) *Thermometer* (see **5.1.2** of BS 4591:1990). For measurement of distillation ranges not greater than 5 °C, use a partial immersion thermometer, graduated at intervals of 0.2 °C, complying with BS 593 (e.g. a thermometer designated F200C/100). For measurement of distillation ranges greater than 5 °C, use a thermometer designated F255C/100 complying with BS 593.

b) *Distillation* (see **7.2** of BS 4591:1990). Regulate the rate of heating so that the first drop of distillate falls from the end of the condenser after 15 min to 20 min.

c) *Corrections to be applied to observed temperatures* (see **9.1.2** of BS 4591:1990). If the corrected barometric pressure deviates from 101.3 kPa apply corrections to the observed temperatures by subtracting 0.038 °C for every 0.1 kPa above 101.3 kPa, or adding 0.038 °C for every 0.1 kPa below 101.3 kPa.

6 Determination of water content

Determine the water content by one of the methods described in BS 2511.

7 Determination of ash

7.1 Principle

A test portion is burned and then heated at a temperature of 600 ± 30 °C to constant mass.

7.2 Apparatus

7.2.1 *Ordinary laboratory apparatus.*

7.2.2 *Platinum or silica dish.*

7.2.3 *Electric furnace,* capable of being controlled at a temperature of 600 ± 30 °C.

7.3 Procedure

7.3.1 *Test portion*

Weigh, to the nearest 0.1 g, about 50 g of the laboratory sample.

7.3.2 *Determination*

In the dish (see **7.2.2**), previously heated at a temperature of 600 ± 30 °C, cooled in a desiccator and weighed to the nearest 0.0001 g, slowly burn the test portion (see **7.3.1**) in several portions. Heat finally in the furnace (see **7.2.3**), controlled at 600 ± 30 °C, until all the carbonaceous matter has disappeared. Allow to cool in a desiccator and weigh to the nearest 0.0001 g. Repeat the operations of heating, cooling and weighing until the difference in mass between two successive weighings does not exceed 0.0005 g.

7.4 Expression of results

The ash A, expressed as a percentage by mass, is given by the equation:

$$A = \frac{100\ m_1}{m_0}$$

where

m_0 is the mass of the test portion (see **7.3.1**) (in g);

m_1 is the mass of the residue (in g).

8 Determination of acidity

8.1 Principle

The acidity in a test portion is titrated with a standard volumetric sodium hydroxide solution, in ethanolic medium, using phenolphthalein as indicator.

[1)] Detailed information on the sampling of liquid chemical products is given in BS 5309-1 and BS 5309-3.

8.2 Reagents

8.2.1 *General.* During the analysis, use only reagents of recognized analytical grade, only methylated spirits complying with BS 3591, and only water complying with grade 3 of BS 3978.

8.2.2 *Ethanol, 95 % (V/V), or industrial methylated spirits, 95 % (V/V).*

NOTE The use of industrial methylated spirits is governed by the Methylated Spirits Regulations, 1983 (S.I.1983 No.252). It is not permissible to use duty-free ethanol, received under the provisions of The Alcoholic Liquor Duties Act 1979, Section 10, for purposes for which industrial methylated spirits is an acceptable alternative.

8.2.3 *Sodium hydroxide,* standard volumetric solution, c(NaOH) = 0.1 mol/L.

8.2.4 *Phenolphthalein,* 5 g/L ethanolic solution.

Dissolve 0.5 g of phenolphthalein in 100 mL of the ethanol or industrial methylated spirits (see **8.2.2**) and make faintly pink by the addition of dilute sodium hydroxide solution.

8.3 Apparatus

8.3.1 *Ordinary laboratory apparatus.*

8.3.2 *Burette,* of capacity 10 mL, graduated in 0.02 mL divisions, complying with class A of BS 846.

8.4 Procedure

8.4.1 ***Test portion***

Take 100 mL of the laboratory sample by means of a pipette.

8.4.2 ***Determination***

Introduce 100 mL of the ethanol or industrial methylated spirits (see **8.2.2**) into a 500 mL conical flask, add 1 mL of the phenolphthalein solution (see **8.2.4**) and make faintly pink by the addition of the sodium hydroxide solution (see **8.2.3**). Add the test portion (see **8.4.1**) to the flask and titrate the mixture with the sodium hydroxide solution from the burette (see **8.3.2**), until the pink colour persists for 5 s.

8.5 Expression of results

The acidity B, expressed as a percentage by mass of acetic acid (CH_3COOH) per kilogram, is given by the equation:

$$B = \frac{0.006V}{\rho}$$

where

V is the volume of the sodium hydroxide solution (see **8.2.3**) used for the titration (in mL);

ρ is the density of the laboratory sample at 20 °C (determined by the method described in BS 4522) (in g/mL);

0.006 is the mass of acetic acid corresponding to 1.00 mL of sodium hydroxide solution, c(NaOH) = 0.100 mol/L (in g).

Alternatively, the acidity C, expressed in terms of acid value, is given by the equation:

$$C = \frac{0.0561V}{\rho}$$

NOTE The "acid value" is the number of milligrams of potassium hydroxide required to neutralize the acidity of 1 g of the sample.

9 Determination of aldehydes and ketones content

9.1 Principle

The carbonyl compounds present in a test portion are allowed to react with hydroxylammonium chloride to form an oxime. The liberated hydrochloric acid is titrated with a standard volumetric, ethanolic potassium hydroxide solution using a potentiometric method.

9.2 Reagents

9.2.1 *General.* During the analysis, use only reagents of recognized analytical grade and only water complying with grade 3 of BS 3978.

9.2.2 *Ethanol,* anhydrous.

9.2.3 *Hydroxylammonium chloride,* 10 g/L ethanolic solution.

Dissolve 50 g of hydroxylammonium chloride ($NH_2OH.HCl$) in 90 mL of water and dilute to 1 000 mL with 95 % (*V*/*V*) ethanol. Further dilute 100 mL of this solution to 500 mL with 95 % (*V*/*V*) ethanol.

9.2.4 *Potassium hydroxide,* standard volumetric solution in 95 % (*V*/*V*) ethanol,

c(KOH) = 0.1 mol/L; or

9.2.5 *Potassium hydroxide,* standard volumetric solution in 95 % (*V*/*V*) ethanol,

c(KOH) = 0.01 mol/L.

9.3 Apparatus

9.3.1 *Ordinary laboratory apparatus.*

9.3.2 *Two conical flasks,* of borosilicate glass, of capacity 250 mL, fitted with ground glass stoppers.

9.3.3 *Two water-cooled reflux condensers,* with ground glass joints to fit the flasks (see **9.3.2**).

9.3.4 *pH meter,* fitted with a glass measuring electrode and a calomel reference electrode.

9.4 Procedure

9.4.1 *Test portion*

Into one of the conical flasks (see **9.3.2**) already containing 10 mL of the hydroxylammonium chloride solution (see **9.2.3**), weigh, to the nearest 0.001 g, 25 g to 30 g of the laboratory sample.

9.4.2 *Blank test*

Carry out a blank test at the same time as the determination, following the same procedure but omitting the test portion.

9.4.3 *Determination*

Add 10 mL of the ethanol (see **9.2.2**) to the conical flask (see **9.3.2**) containing the test portion (see **9.4.1**). Attach one of the condensers (see **9.3.3**) to the flask and reflux for 30 min on a boiling-water bath. Remove the flask, still carrying its condenser, from the boiling-water bath and allow to cool to ambient temperature. When cold, wash down the inside of the condenser with 10 mL of the ethanol. Transfer the contents of the flask quantitatively to a 250 mL beaker, washing with 125 mL of the ethanol.

Titrate with the potassium hydroxide solution (see **9.2.4**) or, if greater precision is required, with the potassium hydroxide solution (see **9.2.5**), using the pH meter (see **9.3.4**). The volume/potential graph may be plotted directly, in which case the point of inflection corresponds to the end-point of the titration (pH value about 3). Alternatively, the first derived curve may be plotted, in which case the end-point of the titration corresponds to the turning point of the curve.

9.5 Expression of results

The aldehydes and ketones content D, expressed as a percentage by mass of carbonyl (CO), is given by the equation:

$$D = \frac{28(V_1 - V_0)}{100 \times m}$$

where

V_0 is the volume of the standard volumetric potassium hydroxide solution (see **9.2.4**) used in the blank test (see **9.4.2**) (in mL);

V_1 is the volume of the standard volumetric potassium hydroxide solution (see **9.2.4**) used for the determination (see **9.4.3**) (in mL);

m is the mass of the test portion (see **9.4.1**) (in g);

28 is the relative molecular mass of the carbonyl (CO) group.

If the more dilute standard volumetric potassium hydroxide solution (see **9.2.5**) is used for the titrations, the equation becomes:

$$D = \frac{28(V_1 - V_0)}{1000 \times m}$$

10 Measurement of colour after treatment with sulphuric acid

10.1 Principle

A test portion is treated with sulphuric acid solution, under specified conditions, and the colour developed is compared with that of a Hazen colour standard.

10.2 Reagents

10.2.1 *General.* During the analysis, use only reagents of recognized analytical grade and only methylated spirits complying with BS 3591.

10.2.2 *Sulphuric acid solution,* containing a minimum of 98 % (*m*/*m*) of sulphuric acid (H_2SO_4).

10.2.3 *Industrial methylated spirits, 95 % (V/V).*

NOTE The use of industrial methylated spirits is governed by The Methylated Spirits Regulations, 1983 (S.I.1983 No.252). It is not permissible to use duty-free ethanol, received under the provisions of The Alcoholic Liquor Duties Act 1979, Section 10, for purposes for which industrial methylated spirits is an acceptable alternative.

10.2.4 *Water,* complying with grade 3 of BS 3978.

10.3 Apparatus

10.3.1 *Ordinary laboratory apparatus.*

10.3.2 *Round-bottomed flask,* of capacity 250 mL, of borosilicate glass, fitted with a ground-glass stopper.

10.3.3 *Burette,* of capacity 10 mL, complying with BS 846, capable of delivering the sulphuric acid solution (see **10.2.2**) at the rate of two drops per second at ambient temperature.

10.3.4 *Two matched Nessler cylinders,* of capacity 100 mL.

10.3.5 *Ice-water bath*

10.3.6 *Boiling-water bath,* capable of being maintained at a temperature of 99 °C to 100 °C.

10.4 Procedure

10.4.1 *Cleaning of the apparatus*

WARNING. Attention is drawn to the hazards associated with mixing water and concentrated sulphuric acid solutions.

Carefully clean the flask (see **10.3.2**), the Nessler cylinders (see **10.3.4**), a 100 mL measuring cylinder and a 100 mL beaker with the sulphuric acid solution (see **10.2.2**). Drain thoroughly and rinse carefully in running tap water. Rinse with the water (see **10.2.4**) and then the methylated spirits (see **10.2.3**). Dry thoroughly in gentle stream of clean, dry air.

10.4.2 ***Test portion***

Take 100 mL of the laboratory sample in the cleaned measuring cylinder (see **10.4.1**).

10.4.3 ***Preparation of standard colorimetric solutions***

Prepare the standard colorimetric solutions in accordance with clause **6** of BS 5339:1976.

10.4.4 ***Test***

Rinse the flask (see **10.3.2**) with some of the laboratory sample and drain well. Place the test portion (see **10.4.2**) in the flask and cool for exactly 5 min in the ice-water bath (see **10.3.5**). Keeping the flask immersed in the ice-water bath, immediately start adding from the burette (see **10.3.3**), at the rate of two drops per second, 0.8 mL of the sulphuric acid solution (see **10.2.2**). During this addition, stir the contents of the flask vigorously and continuously by means of an electrically-driven glass stirrer. Ensure that the temperature of the liquid in the flask does not exceed 20 °C. When the addition is complete, stopper the flask, swirl the contents to ensure complete solution and immediately immerse the bulb of the flask in the ice-water bath for exactly 3 min.

Close the flask with the cleaned, inverted 100 mL beaker (see **10.4.1**) and quickly place the assembly in the boiling-water bath (see **10.3.6**). Clamp the flask in position, ensuring that the level of the water in the bath completely covers the liquid level in the flask but does not touch the rim of the beaker throughout the test. Allow to stand for 60 ± 1 min, while maintaining the temperature of the water at 99 °C to 100 °C.

At the end of this period, remove the flask from the boiling water bath and cool to ambient temperature in running water.

Transfer the contents of the flask to one of the Nessler cylinders (see **10.3.4**) and measure the colour developed by the procedure described in clause **7** of BS 5339:1976.

10.5 Expression of results

Express the colour obtained from the test portion in Hazen units.

11 Determination of total alcohols content

11.1 Principle

The alcohols present in a test portion are esterified by means of acetic anhydride and the excess acetic anhydride is titrated with a standard volumetric, ethanolic potassium hydroxide solution, in the presence of phenolphthalein as indicator.

11.2 Reagents

11.2.1 *General.* During the analysis, use only reagents of recognized analytical grade and only methylated spirits complying with BS 3591.

11.2.2 *Methanol, 95 % (V/V).*

11.2.3 *Acetic anhydride/pyridine mixture.*

WARNING. Because of the toxicity and unpleasant odour of pyridine, it is recommended that it should be handled with care and in a well-ventilated fume cupboard.

Mix 60 g of acetic anhydride [$(CH_3CO)_2O$] and 440 g of pyridine (C_5H_5N) and store the mixture in an airtight container of dark-coloured glass.

11.2.4 *Potassium hydroxide,* standard volumetric, ethanolic solution, c(KOH) = 0.2 mol/L.

Wash some solid potassium hydroxide rapidly with the methanol (see **11.2.2**) to remove any potassium carbonate adhering to the surface and prepare an 11.2 g/L solution in 95 % (*V*/*V*) ethanol or 95 % (*V*/*V*) industrial methylated spirits.

NOTE The use of industrial methylated spirits is governed by The Methylated Spirits Regulations, 1983 (S.I.1983 No.252). It is not permissible to use duty-free ethanol, received under the provisions of The Alcoholic Liquor Duties Act 1979, Section 10, for purposes for which industrial methylated spirits is an acceptable alternative.

Standardize this solution against standard volumetric sulphuric acid solution $c(\frac{1}{2}\ H_2SO_4)$ = 0.1 mol/L, using the phenolphthalein solution (see **11.2.5**) as indicator.

11.2.5 *Phenolphthalein,* 5 g/L ethanolic solution.

Dissolve 0.5 g of phenolphthalein in 100 mL of 95 % (*V*/*V*) ethanol, or 95 % (*V*/*V*) industrial methylated spirits, and make faintly pink by the addition of dilute sodium hydroxide solution.

11.2.6 *Water,* complying with grade 3 of BS 3978.

11.3 Apparatus

11.3.1 *Ordinary laboratory apparatus.*

11.3.2 *Two flat-bottomed flasks,* of capacity 100 mL, fitted with ground-glass stoppers.

11.3.3 *Two glass tubes,* at least 1.5 m long, each fitted with a ground-glass joint at one end for connecting to the flasks (see **11.3.2**).

11.3.4 *Burette,* of capacity 10 mL, graduated in 0.02 mL divisions, complying with class A of BS 846.

11.4 Procedure

11.4.1 *Cleaning of the apparatus*

Wash the apparatus after each use in accordance with the following instructions.

NOTE It is essential to wear rubber gloves during the washing operations.

a) *Flasks.* Wipe the joints with cellulose paper; rinse with water; wash with petroleum spirit in a bath; rinse with hot water, then with the methanol (see **11.2.2**) and dry in a heated cabinet.

b) *Glass tubes.* Wipe the joints with cellulose paper; rinse with the methanol (see **11.2.2**), allow to drain and dry in a current of air which has been previously passed over silica gel.

11.4.2 *Test portion*

Take a quantity of the laboratory sample, weighed to the nearest 0.0001 g, as given in Table 1.

11.4.3 *Blank test*

Carry out a blank test at the same time as the determination, following the same procedure but omitting the test portion.

11.4.4 *Determination*

Measure from the burette (see **11.3.4**), 4 mL of the acetic anhydride/pyridine mixture (see **11.2.3**) into one of the flasks (see **11.3.2**).

Add the test portion (see **11.4.2**) to the flask. Fit one of the glass tubes (see **11.3.3**) to the flask, using silicone grease to lubricate the joints. Transfer the flask to a boiling-water bath and leave it immersed for 2 h. At the end of this period, add 2 mL of the water (see **11.2.6**) to the contents of the flask. Shake, allow to stand for 10 min, then cool the flask in running water. Rinse the glass tube with the methanol (see **11.2.2**) and titrate with the potassium hydroxide solution (see **11.2.4**), using a few drops of the phenolphthalein solution (see **11.2.5**) as indicator.

11.5 Expression of results

The total alcohols content *E,* expressed as a percentage by mass, is given by the equation:

$$E = 100 \left(\frac{0.2(V_0 - V_1)}{m \times x} \right)$$

where

V_0 is the volume of the potassium hydroxide solution (see **11.2.4**) used for titrating the excess acetic anhydride in the blank test (see **11.4.3**) (in mL);

V_1 is the volume of the potassium hydroxide solution (see **11.2.4**) used for titrating the excess acetic anhydride in the determination (see **11.4.4**) (in mL);

m is the mass of the test portion (see **11.4.2**) (in g);

x is the theoretical number of moles of alcohol per kilogram (see Table 1.)

For mixed alcohols of unknown composition, the total alcohols content *F,* expressed in moles per kilogram, is given by the equation:

$$F = \frac{0.2(V_0 - V_1)}{m}$$

12 Determination of bromine number

12.1 General

Bromine number shall be taken as being the number of grams of bromine consumed by 100 g of the sample under the conditions of test.

12.2 Principle

A test portion is titrated with a standard volumetric potassium bromide/bromate solution in the presence of mercury(II) chloride, using methyl orange as indicator.

12.3 Reagents

12.3.1 *General.* During the analysis, use only reagents of recognized analytical grade, only methylated spirits complying with BS 3591, and only water complying with grade 3 of BS 3978.

12.3.2 *Mercury(II) chloride,* 20 g/L acid solution.

Dissolve 20 g of mercury(II) chloride ($HgCl_2$) in water. Add to this solution 15 mL of hydrobromic acid solution, ρ approximately 1.46 g/mL, and 170 mL of hydrochloric acid solution, ρ approximately 1.19 g/mL. Dilute to 1 000 mL.

12.3.3 *Potassium bromide/bromate,* standard volumetric solution, $c(Br_2)$ = 0.1 mol/L.

Dissolve 10.000 g of potassium bromide (KBr) and 2.784 g of potassium bromate ($KBrO_3$) in water in a 1 000 mL one-mark volumetric flask and dilute to the mark.

Table 1 — Mass of test portion for determination of total alcohols content

Alcohol	Alkylradical	Alcohol content (theoretical)	Mass of test portion
		mol/kg	g
Hexyl alcohols	C_6H_{13}	9.8	0.200 to 0.300
Heptyl alcohols	C_7H_{15}	8.61	0.200 to 0.300
Octyl alcohols	C_8H_{17}	7.69	0.250 to 0.350
C_7 to C_9 mixed alcohols		7.7	0.250 to 0.350
Nonyl alcohols	C_9H_{19}	6.94	0.250 to 0.350
Decyl alcohols	$C_{10}H_{21}$	6.32	0.400
Undecyl alcohols	$C_{11}H_{23}$	5.8	0.400 to 0.450
Dodecyl alcohols	$C_{12}H_{25}$	5.4	0.450
Tridecyl alcohols	$C_{13}H_{27}$	5	0.450 to 0.550

12.3.4 *Methyl orange,* 0.4 g/L ethanolic solution.

Dissolve 0.04 g of methyl orange in water, add 80 mL of 95 % (*V*/*V*) ethanol, or 95 % (*V*/*V*) methylated spirits, and dilute to the mark with water.

NOTE The use of industrial methylated spirits is governed by The Methylated Spirits Regulations, 1983 (S.I.1983 No.252). It is not permissible to use duty-free ethanol, received under the provisions of The Alcoholic Liquor Duties Act 1979, Section 10, for purposes for which industrial methylated spirits is an acceptable alternative.

12.4 Apparatus

12.4.1 *Ordinary laboratory apparatus.*

12.4.2 *Burette,* of capacity 10 mL, graduated in 0.02 mL divisions, complying with class A of BS 846.

12.5 Procedure

12.5.1 ***Test portion***

Transfer 100 mL of the laboratory sample by means of a pipette to a 250 mL conical flask.

12.5.2 ***Blank test***

Carry out a blank test at the same time as the determination, following the same procedure but omitting the test portion.

12.5.3 ***Determination***

Add 25 mL of the mercury(II) chloride solution (see **12.3.2**) to the conical flask containing the test portion (see **12.5.1**) and mix. Add two or three drops of the methyl orange solution (see **12.3.4**) and titrate with the potassium bromide/bromate solution (see **12.3.3**) from the burette (see **12.4.2**), until the indicator is decolorized.

12.6 Expression of results

The bromine number F is given by the equation:

$$F = \frac{0.008(V_1 - V_0)}{\rho}$$

where

V_0 is the volume of the potassium bromide/bromate solution (see **12.3.3**) used for the blank test (see **12.5.2**) (in mL);

V_1 is the volume of the potassium bromide/bromate solution (see **12.3.3**) used for the determination (see **12.5.3**) (in mL);

ρ is the density of the laboratory sample at 20 °C (determined by the method described in BS 4522) (in g/mL).

Report the result to the nearest 0.1.

13 Test reports

The test report, for each determination, shall include the following information:

a) a complete identification of the sample;

b) a reference to the method used;

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

d) any unusual features noted during the determination;

e) any operation not included in the appropriate clause of this standard or in the British Standards to which reference is made, or regarded as optional.

Appendix A Relationship between British Standards and international standards concerning methods of test for higher alcohols

The relationship between the methods described in BS 4583 and those described in Parts of ISO 1843 is given in Table 2, while the relationship between the British Standards describing general test methods, to which reference is made in BS 4583, and the corresponding international standards, which are specified in ISO 1843-1 or ISO 1843-7 as being applicable to higher alcohols, is given in Table 3.

Table 2 — Relationship between BS 4583 and international standards

Clause no.	Corresponding international standard no.	Subject	Relationship of BS 4583 to international test method
2	1843-1	Sampling	Related
3, **4**, **6**	1843-1	General methods by cross-reference	Related
5	1843-7	Distillation characteristics	Technically equivalent
7	1843-6	Ash	Technically equivalent
8	1843-2	Acidity	Technically equivalent
9	1843-3	Aldehydes and ketones	Technically equivalent
10	1843-8	Colour after treatment with sulphuric acid	Related
11	1843-5	Total alcohols content	Technically equivalent
12	1843-4	Bromine number	Technically equivalent

Table 3 — Relationship between British Standards and corresponding international standards concerning general test methods

BS no.	Corresponding international standard no.	Subject	Relationship of British Standard to international test method
2511	760	Water content	Related
4522	758	Density at 20 °C	Identical
4591	918	Distillation characteristics	Identical
5339	2211	Colour measurement	Identical

blank

Publication(s) referred to

BS 593, *Specification for laboratory thermometers.*

BS 846, *Specification for burettes.*

BS 2511, *Methods for the determination of water (Karl Fischer method).*

BS 3591, *Specification for industrial methylated spirits.*

BS 3978, *Specification for water for laboratory use.*

BS 4522, *Method for determination of absolute density at 20 °C of liquid chemical products for industrial use.*

BS 4591, *Method for determination of distillation characteristics of organic liquids (other than petroleum products).*

BS 5309, *Methods for sampling chemical products.*

BS 5309-1, *Introduction and general principles.*

BS 5309-3, *Sampling of liquids.*

BS 5339, *Method of measurement of colour in Hazen units (platinum-cobalt scale) of liquid chemical products.*

ISO 1843, *Higher alcohols for industrial use — Methods of test.*

ISO 1843-1, *General.*

ISO 1843-2, *Determination of acidity to phenolphthalein — Titrimetric method.*

ISO 1843-3, *Determination of carbonyl compounds content — Potentiometric method.*

ISO 1843-4, *Determination of bromine number — Titrimetric method in the presence of mercury(II) chloride.*

ISO 1843-5, *Determination of total alcohols content — Titrimetric method.*

ISO 1843-6, *Determination of ash.*

ISO 1843-7, *Determination of distillation yield.*

ISO 1843-8, *Sulphuric acid colour test.*

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

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