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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 1063

SURFACE ACTIVE AGENTS

DETERMINATION OF STABILITY IN HARD WATER

1st EDITION

April 1969

For each individual country the only valid standard is the national standard of that country.

Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

BRIEF HISTORY

The ISO Recommendation R 1063, *Surface active agents – Determination of stability in hard water,* was drawn up by Technical Committee ISO/TC 91, *Surface active agents,* the Secretariat of which is held by the Association Française de Normalisation (AFNOR).

Work on this question led to the adoption of a Draft ISO Recommendation.

In December 1967, this Draft ISO Recommendation (No. 1423) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Austria	India	Romania
Belgium	Iran	Spain
Canada	Israel	South Africa, Rep. of
Chile	Japan	Sweden
Czechoslovakia	Korea, Rep. of	Switzerland
France	Netherlands	Turkey
Germany	New Zealand	U.A.R.
Greece	Poland	United Kingdom
Hungary	Portugal	Yugoslavia

No Member Body opposed the approval of the Draft.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in April 1969, to accept it as an ISO RECOMMENDATION'

ISO Recommendation R 1063 April 1969

SURFACE ACTIVE AGENTS

DETERMINATION OF STABILITY IN HARD WATER

INTRODUCTION

The stability of surface active agents in hard water is of great importance for all the applications of these substances, since the precipitates obtained with hard water can reduce their effectiveness in practice.

1. SCOPE

This ISO Recommendation describes a method for assessing the stability in hard water of surface active agents which are readily soluble at ambient temperature or slightly higher temperatures.

2. FIELD OF APPLICATION

This method applies to surface active agents soluble in water at 20 °C. It can be extended to those which are soluble at a temperature of approximately 50 °C.

3. TERMINOLOGY

3.1 The *hardness of water* is due to the presence of soluble alkaline earth compounds (particularly those of calcium) and is expressed in milliequivalents of calcium ions per litre.*

3.2 The *stability of a surface active agent in hard water* is determined by the solubility of the compounds formed by ion exchange between the surface active agent and the calcium ions, or by the modification of the colloidal state by ionic forces, salt effect, etc.

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* See ISO Recommendation R . . ., *Surface active agents – Preparation of water with known calcium hardness* (at present at the stage of draft proposal), which gives, in an appendix, a conversion table indicating the correlation between the various units of measurement of the hardness of water.

4. PRINCIPLE

Mixing of a solution of the surface active agent in differing concentrations with water of differing known hardness.

After leaving the solutions to stand in specified conditions, observation of their appearance, i.e. clearness, opalescence, cloudiness or precipitation.

5. REAGENTS

Hard water solutions

Prepare a solution S by dissolving 44.1 g ± 0.1 g of analytical reagent grade calcium chloride ($CaCl_2.2H_2O$) in distilled water and dilute to a volume of 1000 ml.

The total hardness of this solution is 600 milliequivalents (meq) per litre.

From the solution S prepare three solutions, S_1, S_2 and S_3, by diluting to 1000 ml, with distilled water, portions of solution S according to Table 1 below :

TABLE 1 – **Hard water solutions**

	Solution S_1	Solution S_2	Solution S_3
Volume of portion of solution S diluted to 1000 ml	10 ml	15 ml	20 ml
Hardness of solution obtained	6 meq per litre	9 meq per litre	12 meq per litre

6. APPARATUS

Ordinary laboratory apparatus, and in particular

6.1 *15 test tubes,* for example, 30 mm in diameter and 200 mm long, having a graduation at 50 ml.

Experience has shown that test tubes with a flat bottom are preferable, as they make it easier to observe cloudiness or precipitates.

6.2 *Pipette,* 5 ml, graduated at every 0.05 ml.

6.3 *Thermostatically controlled water bath* for measurements carried out at temperatures above 20 °C.

7. PROCEDURE

7.1 Preparation of test solution

Prepare a stock solution of 50 g/l of surface active agent in distilled water at 20 °C. If the products are not readily soluble at 20 °C, prepare the solution at 50 °C. This temperature should be stated in the test report.