

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

**ISO RECOMMENDATION
R 1554**

CHEMICAL ANALYSIS OF COPPER AND COPPER ALLOYS

**ELECTROLYTIC DETERMINATION OF COPPER
IN WROUGHT AND CAST COPPER ALLOYS**

1st EDITION

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BRIEF HISTORY

The ISO Recommendation R 1554, *Chemical analysis of copper and copper alloys – Electrolytic determination of copper in wrought and cast copper alloys*, was drawn up by Technical Committee ISO/TC 26, *Copper and copper alloys*, the Secretariat of which is held by the Deutscher Normenausschuss (DNA).

Work on this question led to the adoption of Draft ISO Recommendation No. 1554, which was circulated to all the ISO Member Bodies for enquiry in March 1968.

The Draft was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

| | | |
|----------------|-----------------------|----------------|
| Australia | Iran | Spain |
| Belgium | Israel | Sweden |
| Canada | Italy | Switzerland |
| Czechoslovakia | Netherlands | Thailand |
| Finland | New Zealand | Turkey |
| France | Norway | U.A.R. |
| Germany | Peru | United Kingdom |
| Hungary | Poland | U.S.A. |
| India | South Africa, Rep. of | Yugoslavia |

No Member Body opposed the approval of the Draft.

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided to accept it as an ISO RECOMMENDATION.

CHEMICAL ANALYSIS OF COPPER AND COPPER ALLOYS

ELECTROLYTIC DETERMINATION OF COPPER
IN WROUGHT AND CAST COPPER ALLOYS

1. SCOPE

This ISO Recommendation describes an electrolytic method for the determination of copper in wrought and cast copper-zinc alloys, copper-aluminium alloys and copper-nickel-zinc alloys, as listed in the relevant ISO Recommendations.

2. PRINCIPLE

Electrolytic determination of copper from fluoroboric-nitric acid solution.

3. REAGENTS

All the reagents should be of analytical grade. Use distilled or de-ionized water.

- 3.1 Boric acid (H_3BO_3) 40 g/l solution.
- 3.2 Hydrofluoric acid, 38 to 40 %. *
- 3.3 Nitric acid 1 + 1 ($d = 1.2$).
- 3.4 Ammonia ($d = 0.91$).

4. APPARATUS

Ordinary laboratory and electrolysis equipment.

NOTE. — Preference should be given to a 6 V accumulator as current source. If a rectifier is to be used, an additional buffer battery is recommended.

- 4.1 *Cathode.* It is recommended that a platinum cathode (Winkler electrode)** be used. It should be made preferably from gauze containing approximately 400 meshes per square centimetre (50 meshes per linear inch). Gauze for cathodes should be woven from wire of approximately 0.20 mm diameter. The cathode should be stiffened by doubling the gauze for about 3 mm at the top and the bottom of the cylinder or by reinforcing the gauze at the top and bottom with a platinum band or ring. The cylinder should be approximately 30 to 50 mm in diameter and 40 to 60 mm in height. The stem should be made from a platinum alloy wire, such as platinum-iridium, platinum-rhodium or platinum-ruthenium, having a diameter of approximately 1.30 mm. It should be flattened and welded the entire length of the gauze. The overall height of the cathode should be approximately 130 mm. The cathode should be sandblasted.
- 4.2 *Anode.* It is recommended that a spiral anode be used. It should be made from 1 mm diameter or larger platinum alloy wire formed into a spiral of seven turns, having a height of approximately 50 mm and a diameter of 12 mm, the overall height being approximately 130 mm. The spiral section should be sandblasted.
In the case of an analysis of alloys containing lead, gauze anodes should be used.

5. SAMPLING

Follow the procedure given in ISO Recommendation R . . . ***.

* It is also possible to use hydrofluoric acid, 48 %.
** Platinum cathodes formed from plain or perforated sheets may also be used.
*** Under study.