
**Fireworks — Test methods for
determination of specific chemical
substances —**

**Part 7:
Chlorates content by chemical
titration analysis**

*Artifices de divertissement — Méthodes d'essai pour la détermination
de substances chimiques spécifiques —*

Partie 7: Teneur en chlorates par analyse chimique par titrage



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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 264, *Fireworks*.

A list of all the parts in the ISO 22863 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Fireworks — Test methods for determination of specific chemical substances —

Part 7:

Chlorates content by chemical titration analysis

1 Scope

This document specifies the qualitative and quantitative analysis methods for the determination of the chlorates content in pyrotechnic compositions by chemical titration analysis, with the minimum detection limit (Cl O_3^{-1}) of 1 000 mg/kg.

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 22863-1, *Fireworks — Test methods for determination of specific chemical substances — Part 1: General*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22863-1 apply.

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

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

4 Principle of the method

Qualitative analysis: if any, the chlorates in the sample are dissolved in water, and then the presence of chlorates is detected by special coloration reaction of aniline hydrochloride under strong acidic conditions.

Quantitative analysis: After the sample is extracted by ethanol, the chlorate(s) is(are) dissolved in hot water and reacted totally with an excess of ammonium ferrous sulphate solution. The remaining content of ammonium ferrous sulphate in the sample test solution is then titrated by a potassium dichromate standard solution. The initial content of chlorate in the sample test solution is calculated from the difference between (1) the volume of consumed potassium dichromate standard solution in the sample solution titration and (2) the volume of consumed potassium dichromate in a blank titration of a solution that contains the same quantity of ammonium ferrous sulphate as added to the sample test solution.

5 Safety Requirements

Laboratory operations should comply with appropriate safety requirements: peculiarly, for flammable, explosive, highly toxic and other dangerous materials and samples as well as strong acids, strong alkali and other corrosive materials, operators should wear appropriate protection equipment and follow appropriate safety rules.