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# Zinc Chloride

ZnCl<sub>2</sub> 136.28

Zinc chloride CAS RN®: 7646-85-7; UNII: 86Q357L16B.

## DEFINITION

Zinc Chloride contains NLT 97.0% and NMT 102.0% of zinc chloride (ZnCl<sub>2</sub>).

## IDENTIFICATION

- **A.** The retention time of the zinc peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the Assay.
- **B.** [IDENTIFICATION TESTS—GENERAL \(191\)](#), [Chemical Identification Tests, Chloride](#): Meets the requirements

## ASSAY

**Change to read:**

### PROCEDURE

**Diluent, Mobile phase,** ▲ and ▲ (IRA 1-Jun-2024) **Post-column derivatization reagent** ▲ (IRA 1-Jun-2024) : Proceed as directed in [Zinc Determination \(591\), Procedure, Ion Chromatographic Method](#).

**Standard solution:** 30 µg/mL of [USP Zinc Chloride RS](#) in *Diluent*

**Sample solution:** 30 µg/mL of Zinc Chloride in *Diluent*

**Chromatographic system:** Proceed as directed in [Zinc Determination \(591\), Procedure, Ion Chromatographic Method](#) except for the Columns.

### Columns

**Guard:** 4.0-mm × 5-cm; 9-µm packing [L100](#). [NOTE—Alternatively, a 4.0-mm × 0.5-cm; 4.6-µm packing [L91](#) column may be used.]

**Analytical:** 4.0-mm × 25-cm; 9-µm packing [L100](#). [NOTE—Alternatively, a 4.0-mm × 25-cm; 4.6-µm packing [L91](#) column may be used.]

### ▲System suitability

**Sample:** *Standard solution*

#### Suitability requirements

**Tailing factor:** NMT 2.0

**Relative standard deviation:** NMT 0.73% ▲ (IRA 1-Jun-2024)

## Analysis

**Samples:** *Standard solution* and *Sample solution*

Calculate the percentage of zinc chloride (ZnCl<sub>2</sub>) in the portion of Zinc Chloride taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times 100$$

$r_U$  = peak response of zinc from the *Sample solution*

$r_S$  = peak response of zinc from the *Standard solution*

$C_S$  = concentration of [USP Zinc Chloride RS](#) in the *Standard solution* (µg/mL)

$C_U$  = concentration of Zinc Chloride in the *Sample solution* (µg/mL)

**Acceptance criteria:** 97.0%–102.0%

## IMPURITIES

- [CHLORIDE AND SULFATE \(221\)](#), [Sulfate](#)

**Standard solution:** 0.20 mL of 0.020 N [sulfuric acid](#)

**Sample solution:** 1.0 g of Zinc Chloride in 30 mL of [water](#)

**Acceptance criteria:** 20 mL of the *Sample solution* shows no more sulfate than the *Standard solution* (0.03%).

- [LEAD \(251\), Procedures, Procedure 1: Chemical Method](#)

**Potassium cyanide solution:** Prepare as directed in [\(251\)](#).

**Standard solution:** Add 5 mL of [water](#), 2.50 mL of [standard lead solution TS](#), and 15 mL of *Potassium cyanide solution* (100 mg/mL) to a color-comparison tube.

**Sample solution:** Dissolve 0.50 g of Zinc Chloride in 5 mL of [water](#), and transfer the solution to a similar color-comparison tube. Add 15 mL of *Potassium cyanide solution* (100 mg/mL), and allow the mixture to become clear.

**Analysis:** To each tube add 0.1 mL of [sodium sulfide TS](#). Mix the contents of each tube, and allow to stand for 5 min.

**Acceptance criteria:** Viewed downward over a white surface, the *Sample solution* is not darker than the *Standard solution* (NMT 0.005%).

• **LIMIT OF AMMONIUM SALTS**

**Sample solution:** 100 mg/mL of Zinc Chloride in [water](#)

**Analysis:** To 5 mL of the *Sample solution* add 1 N [sodium hydroxide](#) until the precipitate first formed is redissolved, then warm the solution.

**Acceptance criteria:** No odor of ammonia is perceptible.

• **LIMIT OF OXYCHLORIDE**

**Sample solution:** Dissolve 1.0 g of Zinc Chloride in 20 mL of [water](#), and add 20 mL of [alcohol](#).

**Analysis:** To 10 mL of the *Sample solution* add 0.30 mL of 1.0 N [hydrochloric acid](#).

**Acceptance criteria:** The solution becomes perfectly clear.

• **ALKALIES AND ALKALINE EARTHS**

**Sample solution:** Dissolve 2.0 g of Zinc Chloride in 150 mL of [water](#) contained in a 200-mL volumetric flask. Add sufficient [ammonium sulfide TS](#) to precipitate the zinc completely, and dilute with [water](#) to volume. Pass through a dry filter, and discard the first portion of the filtrate.

**Analysis:** To 100 mL of the *Sample solution* add 5 drops of [sulfuric acid](#). Evaporate to dryness, and ignite.

**Acceptance criteria:** The weight of the residue is NMT 10 mg (1.0%).

**ADDITIONAL REQUIREMENTS**

• **PACKAGING AND STORAGE:** Preserve in tight containers.

• **USP REFERENCE STANDARDS (11).**

[USP Zinc Chloride RS](#)

**Auxiliary Information** - Please [check for your question in the FAQs](#) before contacting USP.

| Topic/Question             | Contact                                                                     | Expert Committee          |
|----------------------------|-----------------------------------------------------------------------------|---------------------------|
| ZINC CHLORIDE              | <a href="#">Documentary Standards Support</a>                               | SM32020 Small Molecules 3 |
| REFERENCE STANDARD SUPPORT | RS Technical Services<br><a href="mailto:RSTECH@usp.org">RSTECH@usp.org</a> | SM32020 Small Molecules 3 |

**Chromatographic Database Information:** [Chromatographic Database](#)

**Most Recently Appeared In:**

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