Cobalt Nitrate Hexahydrate

Cobalt(II) Nitrate Hexahydrate; Cobaltous Nitrate Hexahydrate

$Co(NO_3)_2 \cdot 6H_2O$ Formula Wt 291.03 CAS No. 10026-22-9

GENERAL DESCRIPTION

Typical appearance: red to plum-colored solid
Analytical use: preparation of cobalt standard solutions
Change in state (approximate): melting point, 55 °C
Aqueous solubility: 159 g in 100 mL at 20 °C

SPECIFICATIONS

Assay ..... 98.0–102.0% $Co(NO_3)_2 \cdot 6H_2O$

	Maximum Allowable
Insoluble matter	0.01%
Chloride (Cl)	0.002%
Sulfate (SO_4)	0.005%
Calcium (Ca)	0.005%
Copper (Cu)	0.002%
Iron (Fe)	0.001%
Lead (Pb)	0.002%
Magnesium (Mg)	0.005%
Nickel (Ni)	0.15%
Potassium (K)	0.01%
Sodium (Na)	0.05%
Zinc (Zn)	0.01%

TESTS

Assay. (By complexometric titration of cobalt). Weigh, to the nearest 0.1 mg, 1.0 g of sample, and dissolve in 200 mL of water. Add about 0.2 g of ascorbic acid and 5 g of ammonium acetate, followed by 10 mL of ammonium hydroxide. Add about 0.1 g of murexide indicator mixture, and titrate with 0.1 M EDTA volumetric solution to the violet end point. The color change must persist for 30 s. One milliliter of 0.1 M EDTA corresponds to 0.02910 g of $Co(NO_3)_2 \cdot 6H_2O$.

$$\% \; Co(NO_3)_2 \cdot 6H_2O = \frac{(\text{mL} \times \text{M EDTA}) \times 29.10}{\text{Sample wt (g)}}$$

Insoluble Matter. (Page 25). Use 10 g dissolved in 100 mL of water.

Chloride. Dissolve 0.50 g in 15 mL of water plus 1 mL of nitric acid, filter if necessary through a small chloride-free filter, and add 1 mL of silver nitrate reagent solution. Any turbidity should not exceed that produced by 0.01 mg of chloride in an equal volume of solution containing the quantities of reagents used in the test. The comparison is best made by the general method for chloride in colored solutions, page 35.

Sulfate. (Page 40, Method 2). Use 4 mL of dilute hydrochloric acid (1 + 1). Evaporate twice.

Calcium, Copper, Iron, Lead, Magnesium, Nickel, Potassium, Sodium, and Zinc. (By flame AAS, page 63).

Sample Stock Solution. Dissolve 20.0 g of sample in water, add 2 mL of nitric acid, and dilute to the mark with water in a 200-mL volumetric flask (1 mL = 0.1 g).

Element	*Wavelength (nm)*	*Sample Wt (g)*	*Standard Added (mg)*	*Flame Type**	*Background Correction*
Ca	422.7	0.80	0.02; 0.04	N/A	No
Cu	324.8	2.0	0.04; 0.08	A/A	Yes
Fe	248.3	2.0	0.02; 0.04	A/A	Yes
Pb	217.0	2.0	0.04; 0.08	A/A	Yes
Mg	285.2	0.20	0.005; 0.01	A/A	Yes
Ni	232.0	0.10	0.075; 0.15	A/A	Yes
K	766.5	0.20	0.01; 0.02	A/A	No
Na	589.0	0.04	0.01; 0.02	A/A	No
Zn	213.9	0.10	0.01; 0.02	A/A	Yes

*A/A is air/acetylene; N/A is nitrous oxide/acetylene.