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Aluminum Zirconium Octachlorohydrate Solution

» Aluminum Zirconium Octachlorohydrate Solution consists of complex basic aluminum chloride that is polymeric and encompasses a range of aluminum-to-zirconium atomic ratios between 6.0:1 and 10.0:1, and a range of (aluminum plus zirconium)-to-chloride atomic ratios between 1.5:1 and 0.9:1. The following solvents may be used: water, propylene glycol, or dipropylene glycol. It contains the equivalent of not less than 90.0 percent and not more than 110.0 percent of the labeled concentration of anhydrous aluminum zirconium octachlorohydrate.

Packaging and storage—Preserve in well-closed containers.

Labeling—Label Solution to state the solvent used and the claimed concentration of anhydrous aluminum zirconium octachlorohydrate.

Identification—

A: A solution containing the equivalent of about 100 mg of anhydrous aluminum zirconium octachlorohydrate per mL responds to the test for *Chloride* ⟨191⟩.

B: *Identification of propylene glycol* (where stated on the label)—Add about 10 mL of isopropyl alcohol to 2 g of Solution, mix, and filter. Evaporate the filtrate to about 1 mL on a steam bath: the IR absorption spectrum of a film of this solution on a silver chloride disk exhibits maxima only at the same wavelengths as that of a similar preparation of a film of propylene glycol.

C: *Identification of dipropylene glycol* (where stated on the label)—Add about 10 mL of isopropyl alcohol to 2 g of Solution, mix, and filter. Evaporate the filtrate to about 1 mL on a steam bath: the IR absorption spectrum of a film of this solution on a silver chloride disk exhibits maxima only at the same wavelengths as that of a similar preparation of a film of dipropylene glycol.

pH ⟨791⟩**:** between 3.0 and 5.0, in a solution prepared by diluting 3 g of the Solution with water to obtain 10 mL.

Arsenic, *Method I* ⟨211⟩**:** Prepare the *Test Preparation* using an accurately weighed quantity of the Solution. The limit is 2 µg per g.

Limit of iron—Using Aluminum Zirconium Octachlorohydrate Solution instead of Aluminum Chlorohydrate Solution, proceed as directed in the test for the *Limit of iron* under *Aluminum Chlorohydrate Solution*. The limit is 75 µg per g.

Content of aluminum—Using about 0.3 g of Aluminum Zirconium Octachlorohydrate Solution, accurately weighed, instead of Aluminum Zirconium Octachlorohydrate, proceed as directed in the test for the *Content of aluminum* under *Aluminum Zirconium Octachlorohydrate*. Use the result to calculate the *Aluminum/zirconium atomic ratio* and the (*Aluminum plus zirconium*)/*chloride atomic ratio*.

Content of zirconium—Using about 500 mg of Aluminum Zirconium Octachlorohydrate Solution, accurately weighed, instead of Aluminum Zirconium Octachlorohydrate, proceed as directed in the test for the *Content of zirconium* under *Aluminum Zirconium Octachlorohydrate*. Use the result to calculate the *Aluminum/zirconium atomic ratio* and the (*Aluminum plus zirconium*)/*chloride atomic ratio*.

Aluminum/zirconium atomic ratio—Divide the percentage of aluminum found in the test for *Content of aluminum* by the percentage of zirconium found in the test for *Content of zirconium*, and multiply by 92.97/26.98, in which 92.97 is the atomic weight of zirconium corrected for 2% hafnium content, and 26.98 is the atomic weight of aluminum: the ratio is between 6.0:1 and 10.0:1.

Content of chloride—Using about 500 mg of Aluminum Zirconium Octachlorohydrate Solution, accurately weighed, instead of Aluminum Zirconium Octachlorohydrate, proceed as directed in the test for the *Content of chloride* under *Aluminum Zirconium Octachlorohydrate*. Use the result to calculate the (*Aluminum plus zirconium*)/*chloride atomic ratio*.

(Aluminum plus zirconium)/chloride atomic ratio—Calculate the (aluminum plus zirconium)/chloride atomic ratio by the formula:

$$[(Al/26.98) + (Zr/92.97)]/(Cl/35.453)$$

in which *Al, Zr,* and *Cl* are the percentages of aluminum, zirconium, and chloride as determined in the tests for *Content of aluminum, Content of zirconium,* and *Content of chloride,* respectively; 26.98 is the atomic weight of aluminum; 92.97 is the atomic weight of zirconium corrected for 2% hafnium content; and 35.453 is the atomic weight of chlorine: the ratio is between 1.5:1 and 0.9:1.

Assay—Calculate the percentage of anhydrous aluminum zirconium octachlorohydrate in the Solution by the formula:

$$Al(\{26.98y + 92.97 + 17.01[3y + 4 - (y + 1)/z] + 35.453(y + 1)/z\}/26.98y)$$

in which *Al* is the percentage of aluminum found in the test for *Content of aluminum*, *y* is the aluminum/zirconium atomic ratio found in the test for *Aluminum/zirconium atomic ratio, z* is the (aluminum plus zirconium)/chloride atomic ratio found in the test for (*Aluminum plus zirconium*)/*chloride atomic ratio,* 26.98 is the atomic weight of aluminum, 92.97 is the atomic weight of zirconium corrected for 2% hafnium content, 17.01 is the molecular weight of the hydroxide anion (OH), and 35.453 is the atomic weight of chlorine (Cl).

Topic/Question	Contact	Expert Committee
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REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM32020 Small Molecules 3

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