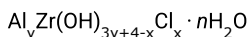


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Aluminum Zirconium Tetrachlorohydrate



» Aluminum Zirconium Tetrachlorohydrate is a polymeric, loosely hydrated complex of basic aluminum zirconium chloride that encompasses a range of aluminum-to-zirconium atomic ratios between 2.0:1 and 5.99:1 and a range of (aluminum plus zirconium)-to-chloride atomic ratios between 1.5:1 and 0.9:1. It contains not less than 90.0 percent and not more than 110.0 percent of the labeled amount of anhydrous aluminum zirconium tetrachlorohydrate.

Packaging and storage—Preserve in well-closed containers.

Labeling—The label states the content of anhydrous aluminum zirconium tetrachlorohydrate.

Identification—A solution (1 in 10) responds to the test for [Chloride \(191\)](#).

pH (791): between 3.0 and 5.0, in a solution [15 in 100 (w/w)].

ARSENIC, Method I (211): 2 µg per g.

Limit of iron—Using Aluminum Zirconium Tetrachlorohydrate instead of Aluminum Zirconium Octachlorohydrate, proceed as directed in the test for *Limit of iron* under [Aluminum Zirconium Octachlorohydrate](#). The specified result is obtained (150 µg per g limit).

Content of aluminum—Using Aluminum Zirconium Tetrachlorohydrate instead of Aluminum Zirconium Octachlorohydrate, proceed as directed in the test for *Content of aluminum* under [Aluminum Zirconium Octachlorohydrate](#). Use the result obtained to calculate the *Aluminum/zirconium atomic ratio* and the *(Aluminum plus zirconium)/chloride atomic ratio*.

Content of zirconium—Using Aluminum Zirconium Tetrachlorohydrate instead of Aluminum Zirconium Octachlorohydrate, proceed as directed in the test for *Content of zirconium* under [Aluminum Zirconium Octachlorohydrate](#). Use the result obtained 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 2.0:1 and 5.99:1.

Content of chloride—Using Aluminum Zirconium Tetrachlorohydrate instead of Aluminum Zirconium Octachlorohydrate, proceed as directed in the test for *Content of chloride* under [Aluminum Zirconium Octachlorohydrate](#). Use the result obtained 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:

$$[(\text{Al}/26.98) + (\text{Zr}/92.97)]/(\text{Cl}/35.453)$$

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 tetrachlorohydrate in the Aluminum Zirconium Tetrachlorohydrate by the formula:

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

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).

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

Topic/Question	Contact	Expert Committee
ALUMINUM ZIRCONIUM TETRACHLOROXYDRATE	Documentary Standards Support	SM32020 Small Molecules 3
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM32020 Small Molecules 3

Chromatographic Database Information: [Chromatographic Database](#)

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