

The Radius Ratio Rule

Ionic crystals comprises many cations and anions. We know that anions are larger in size and surround the smaller cations. They are arranged in space such that anions and cations touch each other and produce maximum stability.

The stability of ionic crystal can be explained on the basis of radius ratio.

The Radius ratio is the ratio of cation to the ratio of anion.

$$\therefore \text{Radius ratio} = \frac{\text{Radius of cation}}{\text{Radius of anion}}$$

Range of Radius Ratio ($\frac{R^+}{R^-}$) value and Geometry of the ionic crystal:—

$\frac{R^+}{R^-}$ (Range of $\frac{R^+}{R^-}$)	co-ordination no.	structural arrangement	Examples
0.155–0.225	3	Triangular Planar	BO_3^{-3}
0.225–0.414	4	Tetrahedral	ZnS, ZnO etc
0.414–0.732	6	Octahedral	NaCl, AgCl etc
0.732–1.000	8	b.c.c	CsCl , CsBr etc

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