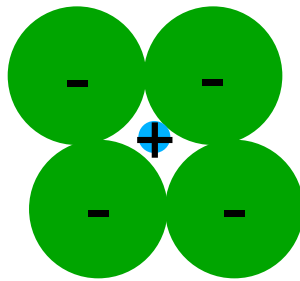


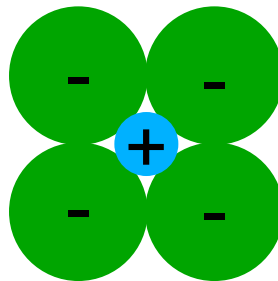
# Ceramic crystal structures

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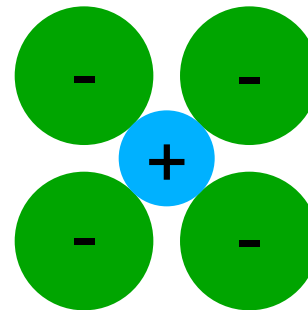
- Site selection rules
  1. Like charges do not touch
  2. Charge balance (stoichiometry)



unstable



stable



stable

Adapted from Fig. 12.1,  
*Callister 7e*.

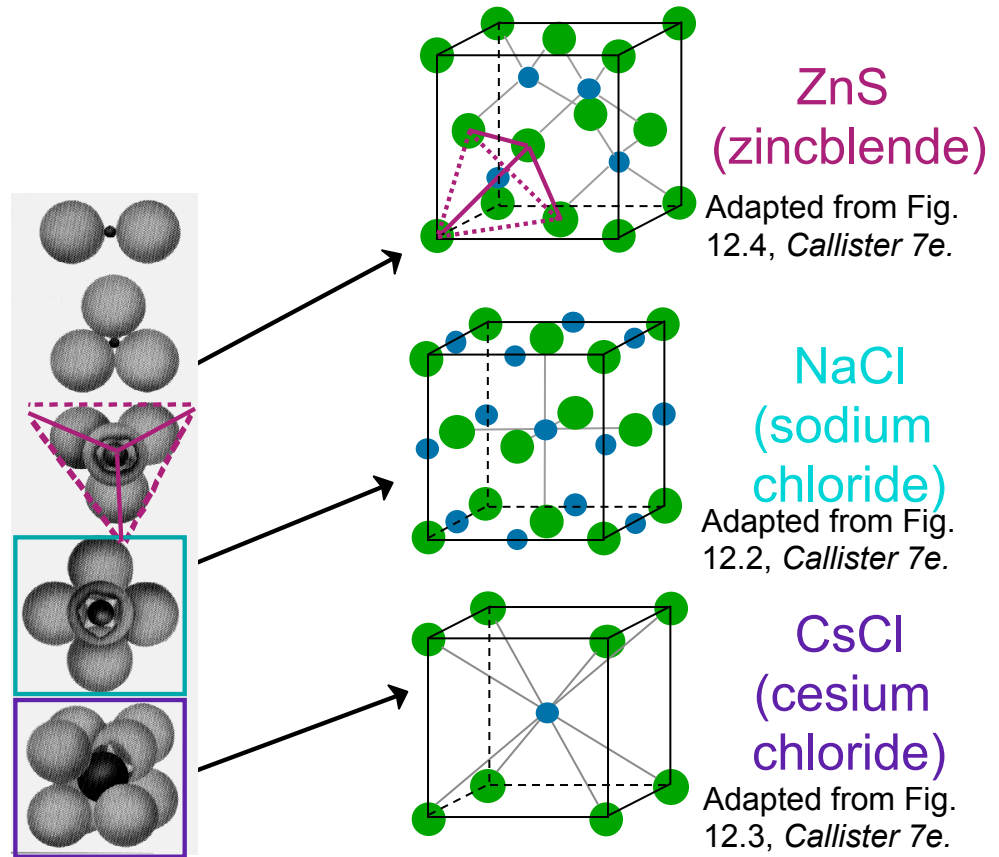
# Coordination number and ionic radii

- Coordination # increases with  $\frac{r_{\text{cation}}}{r_{\text{anion}}}$

**Issue:** How many anions can you arrange around a cation?

$\frac{r_{\text{cation}}}{r_{\text{anion}}}$	Coord #	
$< 0.155$	2	linear
$0.155 - 0.225$	3	triangular
$0.225 - 0.414$	4	$T_D$
$0.414 - 0.732$	6	$O_H$
$0.732 - 1.0$	8	cubic

Adapted from Table 12.2, Callister 7e.

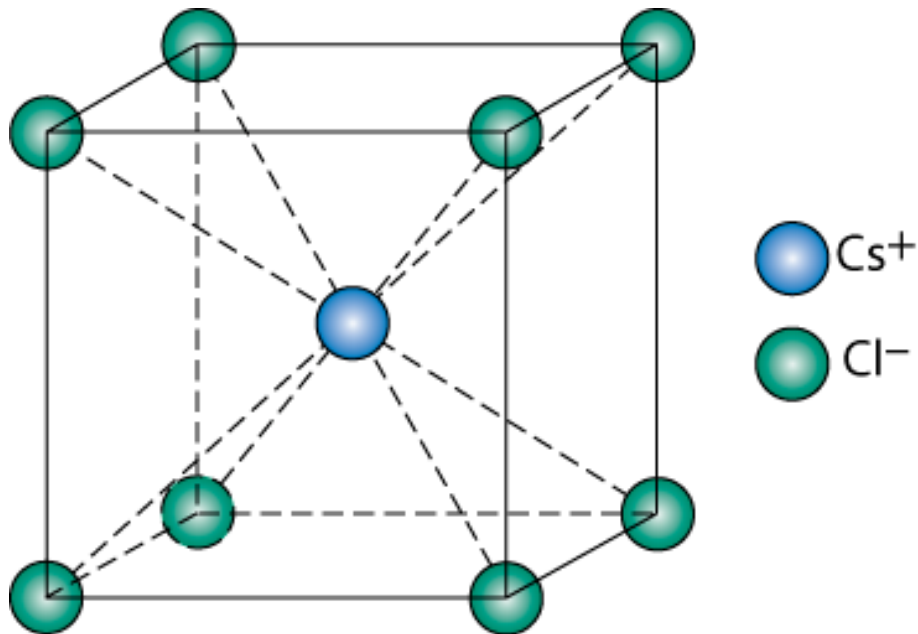


# AX crystal structures

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AX-Type Crystal Structures include NaCl, CsCl, and zinc blende

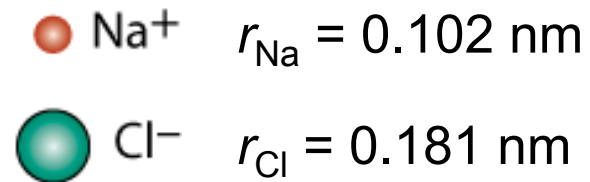
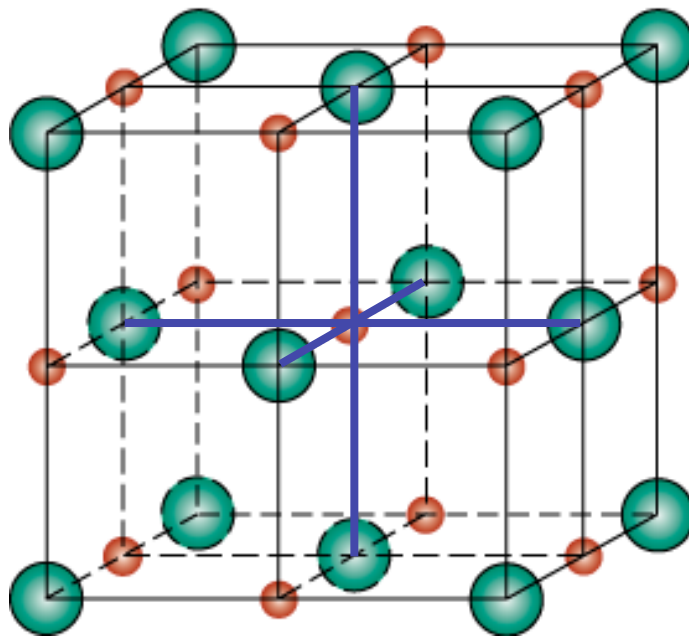
Cesium Chloride structure:



Adapted from Fig.  
12.3, *Callister 7e*.

# Rock salt structure (NaCl)

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Adapted from Fig.  
12.2, *Callister 7e*.