For K⁺ and Br⁻ find the radius ratio of K⁺ ion to Br⁻ ion and on this basis predict (5) the shape of crystal geometry of KBr. Draw a diagram indicating the arrangement of K⁺ and Br⁻ ions in the crystal of KBr.

Answer:

Ionic radius ratio is the ratio of the radius of cation to the radius of the anion. It helps in determining the coordination number and gives clues regarding the nature of crystal structure of Ionic substance.

In K⁺/Br⁻ radius of K⁺/radius of Br⁻ = 133pm/196pm =0.678

As the KBr ionic radius is in the range of 0.414 to 0.732, the lattice structure of KBr is same as NaCl type Crystal structure and octahedral geometry.

Thus KBr has rock salt structure. That is why, coordination number of each ion is 6.

The lattice structure consist of a face centered cube of Br⁻ ions with a K⁺ ion occupying each of the octahedral holes (Figure 1).
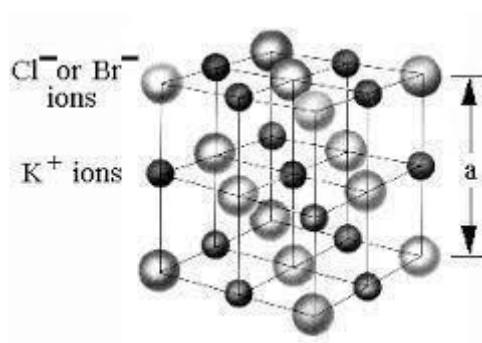

Figure 1 - Arrangement of K⁺ and Br⁻ ions in the crystal of KBr