

The radius of a magnesium atom is 0.160nm. The radius of a nucleus is about 1/10000 that of an atom.

Calculate the radius of a magnesium nucleus giving your answer in standard form

The radius of a magnesium ion is  $7.2 \times 10^{-11} \text{m}$

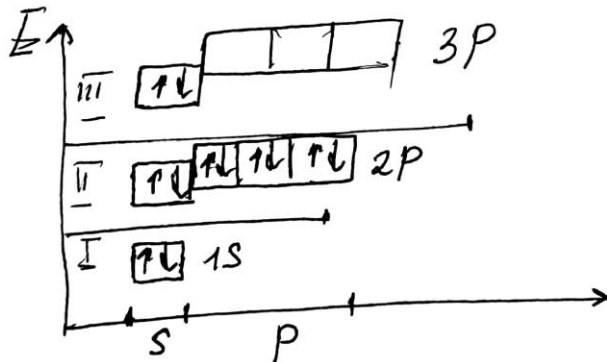
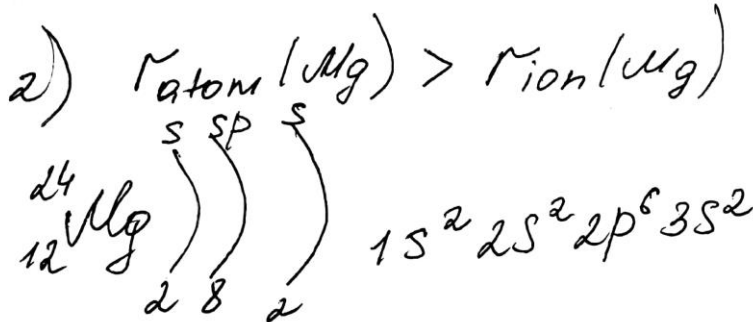
Explain the difference in size between the magnesium atom and magnesium ion.

Solution:

$$1) r_{\text{atom}}(\text{Mg}) = 0,160 \text{ nm} = 1,6 \times 10^{-10} \text{ m};$$

$$r_{\text{nucleus}}(\text{Mg}) = (1,6 \times 10^{-10} \text{ m}) \times (1 \times 10^{-4}) =$$

$$= \underline{1,6 \times 10^{-14} \text{ m.}}$$



So, the ionic radius of cations is smaller than the effective radius of neutral atoms, while the ionic radius of anions is much larger than the radius of neutral atoms.

Answer:  $r_{\text{nucleus}} = 1.6 \times 10^{-14} \text{m}$ .