Checking Radius Claims in a Model Ion Sorter

Scoring guide · one credit per question · review written work against each rubric

Checking Radius Claims in a Model Ion Sorter

Question 1

The atom has two electrons in a third occupied shell. Losing them leaves Mg^{2+} with only two occupied shells, so its outer electrons occupy a region closer to the nucleus.

Question 2

Choice (3)

The two positive ions both have the arrangement 2, 8, but their nuclei contain 12 and 11 protons.

Question 3

Greatest to least is Na^{+}, Mg^{2+}, Al^{3+}. All have the same electron arrangement. As proton count rises from 11 to 12 to 13, the nucleus pulls the electrons closer and the radius decreases.

Question 4

The rule assumes the electron arrangements match. Neutral Mg has three occupied shells, while Al^{3+} has two. Their different arrangements mean that changing proton count is not the only difference.