Ionization Energy Trends Worksheet

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

Ionization Energy Trends

Question 1

Choice (1)

The starting atom is neutral and loses one electron to form Na^+.

Question 2

Potassium’s outer electron occupies a higher principal energy level farther from the nucleus and is shielded by more inner electrons. It takes less energy to remove.

Question 3

Choice (2)

Energy must overcome the attraction between the electron and the nucleus. Stronger attraction requires more energy.

Question 4

The proton count rises while shielding by the inner shells changes relatively little. The greater effective nuclear attraction makes the outer electron harder to remove.

Comparing Period 3 Atoms

Question 5

Choice (1)

Na has the smallest listed value, 5.14 eV per atom.

Question 6

7.65 − 5.99 = 1.66 eV per atom.

Question 7

The electron removed from Al is in a higher-energy 3p orbital. It is easier to remove than the 3s electron removed from Mg.

Question 8

Choice (3)

The endpoint rises from 5.14 to 8.15 eV, while the value drops from 7.65 to 5.99 eV between Mg and Al.