Separating Ions With Matching Electron Counts

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

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Question 1

Electrons equal the proton count minus the signed charge. The four values are 9 − (−1), 10 − 0, 11 − 1, and 12 − 2. All four equal 10.

Question 2

Choice (4)

Bending toward the negative plate means P is positive. Na^{+} and Mg^{2+} are both positive and have 10 electrons.

Question 3

The force gives a charge magnitude of 2. The direction shows the charge is positive. Of the two candidates only Mg^{2+} has charge +2.

Question 4

Among the listed particles only Mg^{2+} has charge magnitude 2, so it is the only match. The magnitude measurement itself does not determine whether the charge is positive or negative. Without the restricted candidate list, a different particle with 10 electrons and charge −2 could fit those two readings in a model.