Investigating a Metal Hinge Fragment

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

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Question 1

Choice (2)

The atomic number is the proton count. Both signals from H have 28 protons, so both are nickel.

Question 2

Both atoms have 28 protons. They contain 58 − 28 = 30 and 60 − 28 = 32 neutrons, respectively, so they are isotopes of nickel.

Question 3

(0.70)(58 u) + (0.30)(60 u) = 58.6 u. This is the mean for the given measured sample under the mass-number approximation.

Question 4

The conclusion is incorrect. Sample H has 28 protons per atom and sample J has 27. Element identity follows the proton count, which ion formation does not change. Having the same number of electrons does not make the elements the same.

Question 5

Choice (2)

The charge in elementary units is protons minus electrons: 28 − 26 = +2 for H and 27 − 26 = +1 for J.