Half-Life from Data Worksheet

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

Half-Life from Data

Question 1

Choice (3)

After one half-life, about one-half of the initial nuclei remain.

Question 2

80.0 mg × (1/2) × (1/2) = 20.0 mg of parent isotope.

Question 3

Choice (4)

Halve the remaining fraction three times to get $(1/2)^3 = 1/8$.

Question 4

Decay of a particular nucleus is random. The half-life describes the pattern for a large collection, so it predicts a fraction remaining over an interval.

Tracking a Model Isotope

Question 5

Choice (2)

The count halves from 1,600 to 800 over the first 6 hours and halves again over the next 6 hours.

Question 6

The interval from 18 to 24 hours is another 6-hour half-life. Half of 200 is 100 nuclei.

Question 7

Choice (4)

1,600 original nuclei minus 400 undecayed nuclei gives 1,200 decayed nuclei.

Question 8

The half-life is still 6 hours because the isotope is the same. Starting with 3,200 nuclei gives about 1,600 after 6 hours, twice the original sample’s 800.