Finding Isotope Patterns With the Same Mean

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A classroom detector models two samples of neon. It uses the rounded isotope masses 20, 21, and 22 u. Each sample record represents 100 atoms. The graphing display can show a separate peak for each isotope, with height proportional to its atom count.

Sample	Count at 20 u	Count at 21 u	Count at 22 u
J	50	0	50
K	25	50	25

1 Calculate the mean atomic mass for both samples. Use the isotope counts. [1]

Answer and work

2 Which single peak distinguishes K from J?

(1) A peak at 20 u

(2) A peak at 21 u

(3) A peak at 22 u

(4) A peak at the same mean as J

A student sees a mean of 21 u on another copy of the report and concludes that the detector must have counted some 21 u atoms.

3 Use the data for one sample to evaluate that conclusion. [1]

Answer and work

4 If the detector instead counted 200 atoms from K in the same proportions, explain what would happen to its calculated mean. [1]

Answer and work