Drawing Fragments From One Shared Bond

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

A display models an H–Cl molecule. The original bond has two shared electrons. It can erase the bond in either of two ways. In model P, each atom keeps one electron from the bond. In model Q, chlorine keeps both. A neutral H atom has one electron. A neutral Cl atom has 17 electrons. Seven of the electrons in a neutral chlorine atom are valence electrons.

Model	Bond electrons H keeps	Bond electrons Cl keeps
P	1	1
Q	0	2

1 Which model gives H a +1 charge?

(1) P only

(2) Q only

(3) Both models

(4) Neither model

2 Compare the individual fragment charges and their combined charge in both models. [1]

Answer and work

A detector responds only to charged particles. A different instrument counts all the fragments, whether charged or neutral.

3 Explain which instrument could distinguish the two models from their fragment readings. [1]

Answer and work

4 Draw the two separate fragments predicted by Q. Show valence electrons as dots and label each fragment’s charge. [1]

Draw and label both fragments