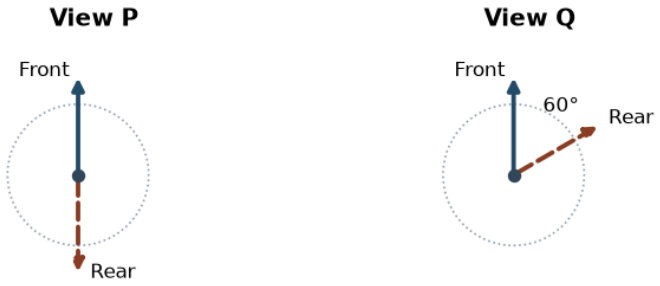
Drawing a Bond Model After an Internal Turn

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

A display shows a model with two carbons joined by one single bond. Each carbon is also bonded to two H atoms and one Cl atom. Look along the C–C bond. In the model the rear carbon can rotate around this bond while keeping all its attachments.



Projected C–Cl directions looking along the central C–C bond.

1 Which observation supports that the two views have the same connection map?

(1) The two C–Cl arrows are opposite in both views.

(2) Each Cl remains attached to the same carbon.

(3) The back arrow has the same direction in both views.

(4) Both views show a broken C–C bond.

2 Describe the difference between the two views that cannot be seen from the shared molecular formula. [1]

Answer and work

The display compares only the two equal-length C–Cl dipole arrows projected into this view. Their projected contributions cancel if the arrows point in exactly opposite directions.

3 Use the model to determine which view gives cancellation for these two arrows. [1]

Answer and work

4 Sketch the two C–Cl arrows in a new view with the front arrow up and the rear arrow 60° to the left of upward. Label front and rear. [1]

Draw the projected bond arrows