2025 Ch H1 Q1

Section: Chemical Changes and Structure

Topic: Periodicity

Question summary

Which bond is pure covalent (non polar) based on electronegativity differences?

Worked solution

A pure covalent bond has very small electronegativity difference, so electrons are shared evenly.

Check each option quickly using periodic trends: electronegativity increases across a period and decreases down a group.

H-Cl, O-H and C-I have noticeable electronegativity differences -> polar covalent.

N-Br have similar electronegativities -> essentially non polar (pure covalent).

Final answer

A. N-Br

Revision tips

- Rule of thumb: delta EN less than about 0.4 -> non polar; about 0.5 to 1.7 -> polar; larger -> ionic character.

- Fast estimates: compare positions in the periodic table to infer delta EN quickly.

- Common pitfalls: assuming any bond with hydrogen is non polar. H-X bonds are usually polar except when X is very close to H in EN.