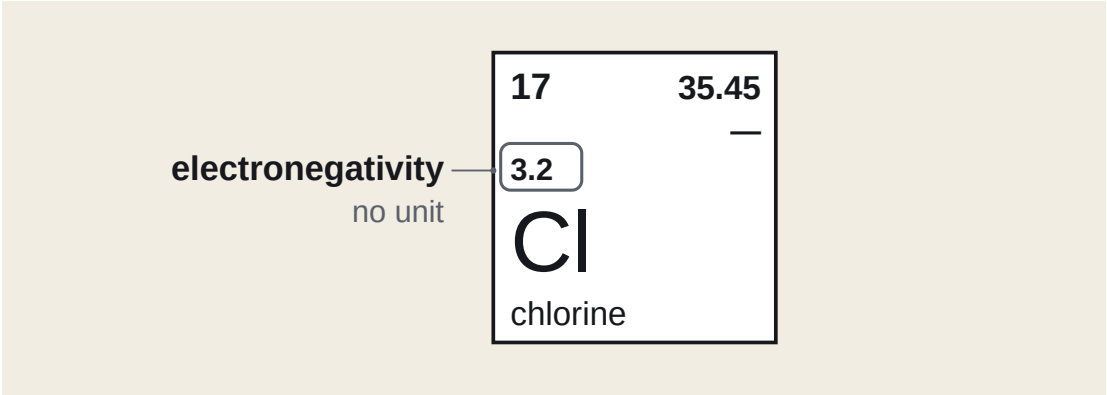
A7 · Electronegativity: from equal sharing to transfer · Notes

Goals: Find the electronegativity of an element in the Data Booklet and describe its trends. Explain non-polar covalent, polar covalent and ionic bonds as points on one scale. Classify a bond from electronegativity and mark δ− and δ+.

Name: _____ Date: _____

Slide 1 of 5 · Electronegativity

In lesson A5, two atoms shared a pair of electrons. Today you ask whether they pull on it equally. One number in the Data Booklet answers that.



Key ideas

_____ says how strongly an atom attracts shared electrons.

A larger number means a _____.

Electronegativity increases across a period, from _____.

Fluorine is _____, the highest of all.

Example

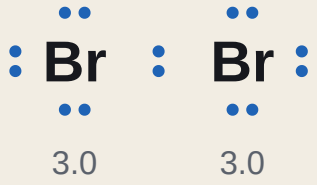
Which atom attracts shared electrons more strongly, oxygen or sulfur? Use the Data Booklet values.

Try it

Which atom attracts shared electrons more strongly, sodium or chlorine? Use the Data Booklet values.

Slide 2 of 5 · Equal and unequal sharing

On the last slide, each atom got a number for its pull. Now compare the two numbers in one bond. They tell you where the shared pair sits.



A difference of 0.0 means equal sharing.

non-polar covalent bond

Key ideas

A difference of 0.0 means the sharing is _____.

Equal sharing is a _____.

Unequal sharing is a _____.

The bond dipole arrow points to the _____.

Example

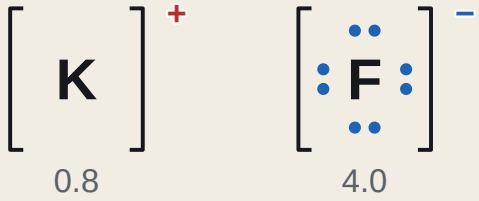
Two chlorine atoms share a pair of electrons in Cl_2. What kind of bond is it? Use the Data Booklet values.

Try it

Hydrogen and bromine share a pair of electrons. Which end of the bond is slightly negative? Use the Data Booklet values.

Slide 3 of 5 · So unequal that an electron moves

On the last slide, a difference of 1.0 made the sharing unequal. A much larger difference does more. The sharing stops being sharing.



0.8 4.0

With a difference of 3.2, the electron moves.

ionic bond

Key ideas

Potassium and fluorine have a difference of _____.

A very large difference means _____.

A metal with a non-metal forms an _____.

About _____ is a rough guide to where ionic bonds begin.

Example

What kind of bond forms between sodium and chlorine? Use the Data Booklet values.

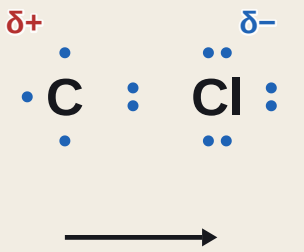
Try it

What kind of bond forms between magnesium and oxygen? Use the Data Booklet values.

Slide 4 of 5 · Classify a bond

The last three slides gave you values, differences and three kinds of bond. Now put them together on bonds you have not seen. To classify a bond is to say which kind it is.

Atom	Value
C	2.6
Cl	3.2
difference	0.6



polar covalent bond

Key ideas

Step 1: _____ the values.

Step 2: _____ the smaller value from the larger.

Step 3: _____ the bond.

The atom with the larger value is _____.

Example

Classify the bond between sulfur and oxygen. Use the Data Booklet values, and mark δ− and δ+.

Try it

Classify the bond between nitrogen and hydrogen. Use the Data Booklet values, and mark δ− and δ+.

Slide 5 of 5 · Method: how to classify a bond from electronegativity

You just classified three bonds. Each time you did the same four things. Here they are as steps.

1. **Find** the two electronegativities.
2. **Subtract** the smaller from the larger.
3. **Classify** the bond from the difference.
4. **Mark** δ− on the larger value, δ+ on the other.



Check: the bond dipole arrow points to δ−.

Used again in: lessons A10 and A11

Key ideas

Step 1: find the _____.

Step 2: find the _____.

Step 3: name the _____ of bond.

Step 4: mark the ends. The bond dipole arrow points to _____.

Example

Use the four steps on the bond between oxygen and fluorine.

Try it

Use the four steps on the bond between lithium and chlorine.