[TP] Which of the following molecules are not polar?

17% 1. $BFCl_2$, whose shape is trigonal-planar, like that of BF_3
17% 2. SCl_2, which is a bent molecule, like H_2O
17% 3. NH_2Cl, whose shape is trigonal-pyramidal, like that of NH_3
17% 4. OCS, which is a linear molecule, like CO_2
17% 5. All of the above are nonpolar
17% 6. All of the above are polar

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Response Counter 10

Lecture 15 CH101 A1 (MWF 9:05 am)

Wednesday, October 11, 2017

For today ...

- Complete: Polarity
- Dipole-dipole versus temporary dipole attraction (dispersion)

Next lecture: PPutting it all together: Relative boiling points; Practice: Intermolecular forces; Dissolving ionic solids; solubility rules (memorize solubility guidelines fig 6.28, p 181);

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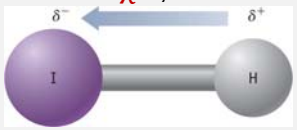
The more different the χ's, the more polar the bond



- If two bonded atoms are different, the one with larger χ gets more of the shared electron cloud
- Atom with larger χ has net negative charge; atom with smaller χ has net positive charge
- The larger the difference in χ, the greater the charge separation (unequal sharing of electron cloud)
- Result is a polar bonds

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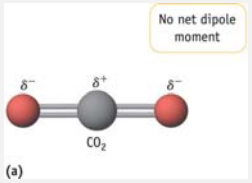
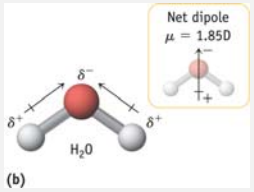
Molecular polarity

- If bond dipoles cancel, molecule is nonpolar
- If bond dipoles do not cancel, molecule is polar





Let's illustrate, for BF_3 and BH_2F

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Consider polarity of the following

- $BFCl_2$, whose shape is trigonal-planar, like that of BF_3
- SCl_2, which is a bent molecule, like H_2O
- NH_2Cl, whose shape is trigonal-pyramidal, like that of NH_3
- OCS, which is a linear molecule, like CO_2

[TP] Which of the following molecules are not polar?

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17% 6. All of the above are polar

[Quiz] Which of the following statements is true about carbon dioxide, O=C=O?

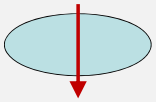
25% 1. CO_2 contains polar bonds and is a polar molecule
25% 2. CO_2 contains polar bonds, but is not a polar molecule
25% 3. CO_2 does not contain polar bonds and is not a polar molecule
25% 4. CO_2 does not contain polar bonds but is a polar molecule

Dipole-dipole versus dispersion

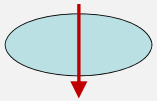
Permanent dipoles

Sketch a second molecule arranged so that it ...

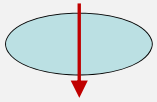
attracts maximally



repels maximally



neither attracts nor repels



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