Intermolecular Forces Student Activity

Open the TI-Nspire document Intermolecular Forces.tns.

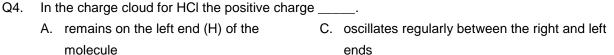
What is it about molecules that makes them stick together? It is the sticking together of molecules that causes them to form liquids and solids. In this activity you will observe the differences between polar and non-polar molecules and discover the different ways these two types of molecules stick together.

Move to pages 1.2–1.4. Answer the following questions here or in the .tns file.

- Q1. The forces within a molecule, for example covalent and ionic bonds, are known as ______ forces.
 - A. intermolecular
- Q2. Intermolecular forces are forces _____.
 - A. between two or more molecules
- Q3. Intermolecular forces arise from the charge clouds surrounding molecules.
 - A. True

Move to pages 1.5 and 1.6.

1. Read and follow the instructions on page 1.5 and observe the simulation on page 1.6.



D. moves randomly between the right and left

B. remains on the right end (CI) of the molecule

A. remains on the left end (H) of the

Move to page 1.8.

2. Read the information on page 1.8.

B. is a polar molecule

molecule

Move to page 1.9. Answer the following guestion here on in the .tns file.

Move to page 1.7. Answer the following question here or in the .tns file.

- Q5. HCl _____. (More than one response may be correct.)
 - A. is a non-polar molecule
- C. has a permanent dipole moment
- D. has a temporary dipole moment

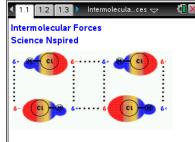
B. intramolecular B. within a single molecule

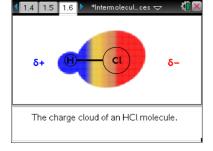
Name

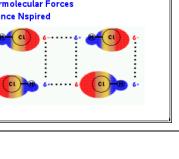
Class

B. False

ends







Intermolecular Forces Student Activity

3. Read and follow the instructions on page 2.1 and observe the

simulation on page 2.2.

Move to pages 2.1 and 2.2.

Move to pages 2.3–2.5. Answer the following questions here or in the .tns file.

- Q6. The attractive forces are between the _____ end of a HCI molecule and the _____ end of another HCI molecule.
 - A. positive, positive
 - B. positive, negative
- Q7. The lines of force between HCI molecules as the charge cloud changes.
 - A. remain constant
- Q8. The intermolecular forces between HCI molecules are .
 - A. induced dipole-induced dipole (London dispersion) forces
 - B. dipole-induced dipole forces

Move to page 3.1.

4. Observe the simulation on page 3.1.

- C. oscillates regularly between the right and left ends
- D. moves randomly between the right and left ends
- Q10. Cl_2 . (More than one response may be correct.)

A. remains on the left end of the molecule

B. remains on the right end of the molecule

A. is a non-polar molecule

Q9. The positive charge for Cl_2 _____.

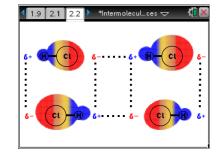
- B. is a polar molecule
- C. has a permanent dipole moment
- D. has a temporary dipole moment

Move to pages 3.2 and 3.3. Answer the following questions here or in the .tns file.

The charge cloud of a CL, molecule.

C. negative, negative

- D. hydrogen, hydrogen
- C. change
 - C. dipole-dipole forces
 - D. ionic bonds



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Class



Intermolecular Forces

Student Activity

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Move to page 4.1.

5. Observe the simulation on page 4.1.

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Move to pages 4.2–4.5. Answer the following questions here or in the .tns file.

- Q11. The lines of force between Cl_2 molecules _____ as the charge cloud changes.
 - A. remain constant B. change
- Q12. The intermolecular forces between Cl_2 molecules are _____.
 - A. induced dipole-induced dipole (London dispersion) forces
 C. dipole-dipole forces

 D. ionic bonds
 - B. dipole-induced dipole forces
- Q13. For molecules of about the same size, I would expect dipole-dipole intermolecular forces to be ______ than induced dipole-induced dipole forces.
 - A. stronger B. weaker
- Q14. Explain your answer to the last question.