AP Chemistry Daily Videos

8.6 Molecular Structure of Acids and Bases

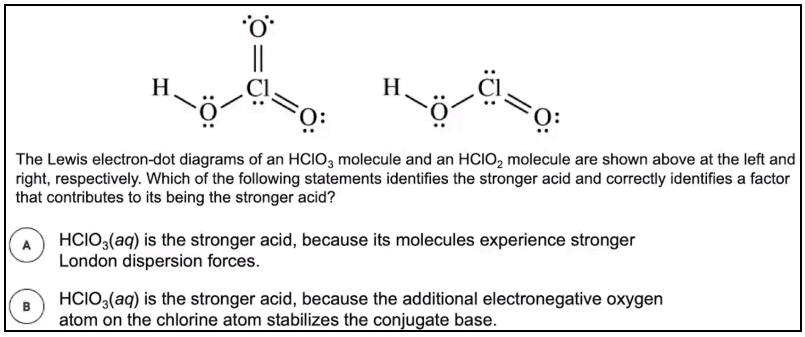
Video #1

1. How easily do strong acids dissociate from H+ compared to weak acids?

2. Describe the difference in bond strength between strong acids and weak acids. Use the image below to guide you.

3. What role do oxygen atoms play in strong acids? Make sure you include polarity in your answer.

4. Evaluate your work.

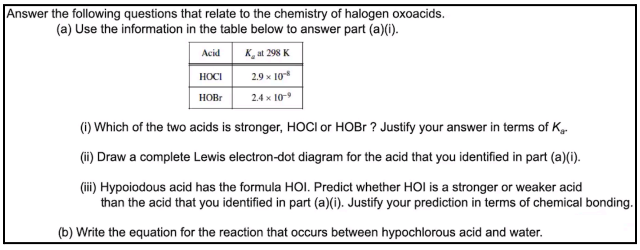


The Lewis electron-dot diagrams of an $HClO_3$ molecule and an $HClO_2$ molecule are shown above at the left and right, respectively. Which of the following statements identifies the stronger acid and correctly identifies a factor that contributes to its being the stronger acid?

(A) $HClO_3(aq)$ is the stronger acid, because its molecules experience stronger London dispersion forces.

(B) $HClO_3(aq)$ is the stronger acid, because the additional electronegative oxygen atom on the chlorine atom stabilizes the conjugate base.

5. Evaluate your work.



Answer the following questions that relate to the chemistry of halogen oxoacids.

(a) Use the information in the table below to answer part (a)(i).

Acid	K_a at 298 K
HOCl	2.9×10^{-8}
HOBr	2.4×10^{-9}

(i) Which of the two acids is stronger, HOCl or HOBr ? Justify your answer in terms of K_a.

(ii) Draw a complete Lewis electron-dot diagram for the acid that you identified in part (a)(i).

(iii) Hypoiodous acid has the formula HOI. Predict whether HOI is a stronger or weaker acid than the acid that you identified in part (a)(i). Justify your prediction in terms of chemical bonding.

(b) Write the equation for the reaction that occurs between hypochlorous acid and water.

⏸ 7:44

6. **What is the relationship between strong acids and their conjugate bases?**

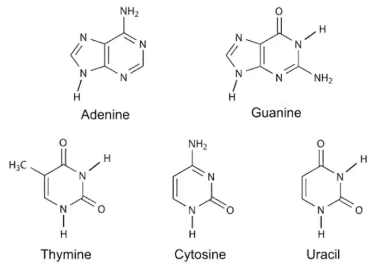
Video #2

1. **What two factors impact whether a species is a strong base?**

2. **Evaluate your work.**

The table below provides the chemical structures for weak bases and their ionization constants, K_b. Based on the data, identify the strongest base and justify your answer using its structure.

Nitrogenous bases



Source: chromatos/Shutterstock.com

Amino Acid	K_b
Thymine	6×10^{-5}
Uracil	3×10^{-7}
Cytosine	3×10^{-10}
Adenine	1×10^{-10}
Guanine	1×10^{-11}

Stop the video here and try the problem on your own!

3. **What is the relationship between strong bases and their conjugate acids?**