

Task 1: Which is the Correct Lewis Structure?

	Isomer 1	Isomer 2
Lewis Structure		
Heat of Formation (kJ/mol)		

Which isomer has the lower heat of formation?

What does it mean for a heat of formation value to be negative? What if the heat of formation value is positive?

Assuming you had a large number of hypochlorous acid molecules, which isomer would most of the molecules be? Why?

Task 2: Lewis Structures and Dipole Moments for Various Compounds

Compound Name	Molecular Formula	Lewis Structure	3D Model with Molecule Dipole Moment Drawn	Dipole Moment Value (Debye)	Is this molecule polar? (yes/no)
Water	H ₂ O				
Carbon Dioxide	CO ₂				
Methanol	CH ₃ OH				

Ethanol	$\text{CH}_3\text{CH}_2\text{OH}$				
Dimethyl ether	CH_3OCH_3				
Cyclobutadiene Hint: C atoms form a four-member ring	C_4H_4				
Iodine difluoride cation	IF_2^+				
Sulfur dioxide	SO_2				
Methylene chloride	CH_2Cl_2				
Dichloroethene Hint: connect the carbon atoms	$\text{C}_2\text{H}_2\text{Cl}_2$				

Task 3: Reflect on the experiment in today's lab

Why is it important to understand the 3D shape of a molecule to determine if it is polar or nonpolar?