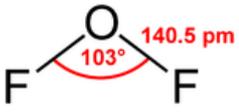
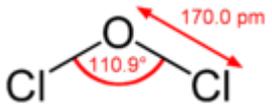


Answer on Question#38743 - Chemistry - Inorganic Chemistry

Question:

Explain the hybridization and bond angle in OF₂ and give a reason for why is it different in Cl₂O?

Answer:

<p>The Lewis structure for OF₂ is:</p>  <p>Hybridization: sp³ Molecular shape: Bent Bond angle FOF = 103°</p>	<p>The Lewis structure for Cl₂O is:</p>  <p>Hybridization: sp³ Molecular shape: Bent Bond angle ClOCl = 110.9°</p>
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We can see that these molecules have the same hybridization, while the bond angle slightly differs. This difference is the result of difference in size and electronegativity between fluorine and chlorine atoms. Larger chlorine atoms repel stronger than fluorine ones. Additionally electron pair in bond O-F is shifted to Fluorine atom, while in bond O-Cl oxygen is more electronegative and pulls the electron pair. The electron pairs closer to central atom show stronger repulsion and this effect also contributes to higher Cl-O-Cl bond angle.