

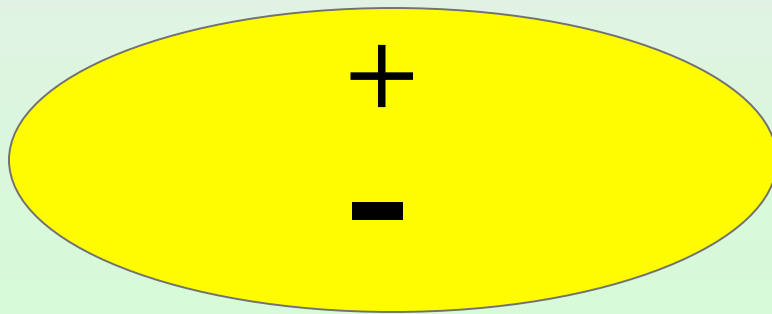
# Dipole Moments

# Dipole Moment

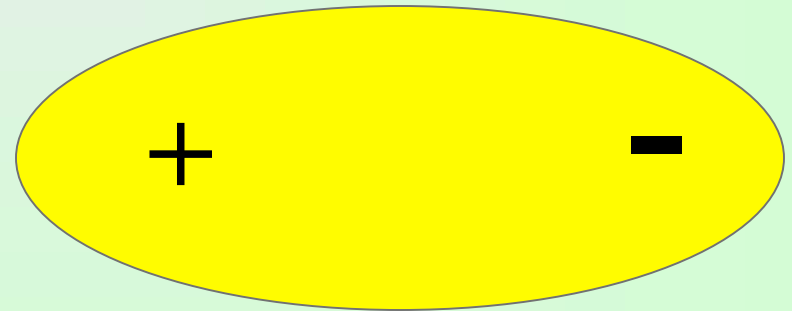
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A substance possesses a dipole moment if its centers of positive and negative charge do not coincide

$$\mu = e \times d \quad \text{Expressed in debye units}$$



not polar



polar

# Molecular Dipole Moment

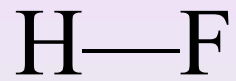
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need to know molecular shape

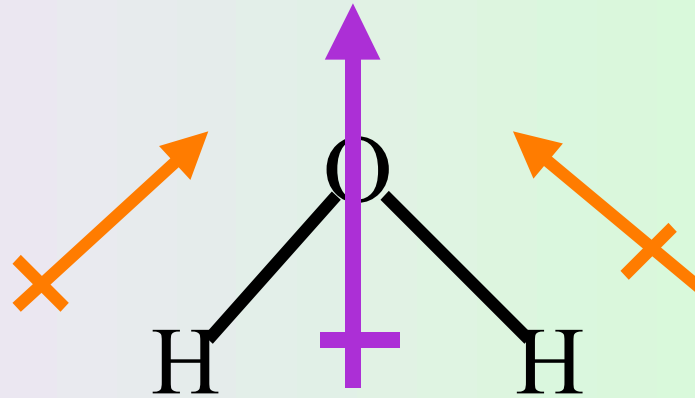
because individual bond dipoles can  
cancel each other out

# examples

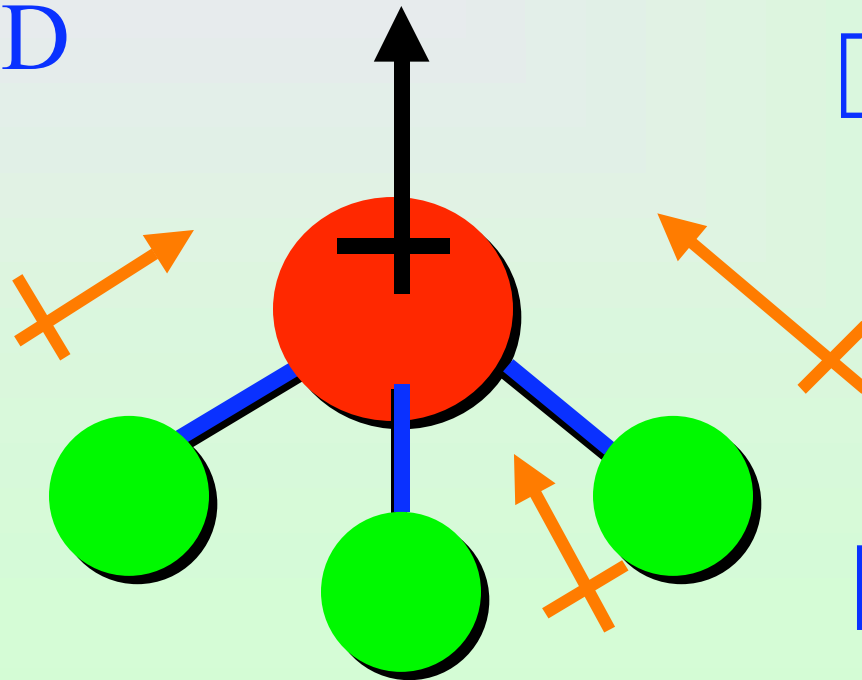
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$\mu = 1.7 \text{ D}$



$\mu = 1.8 \text{ D}$

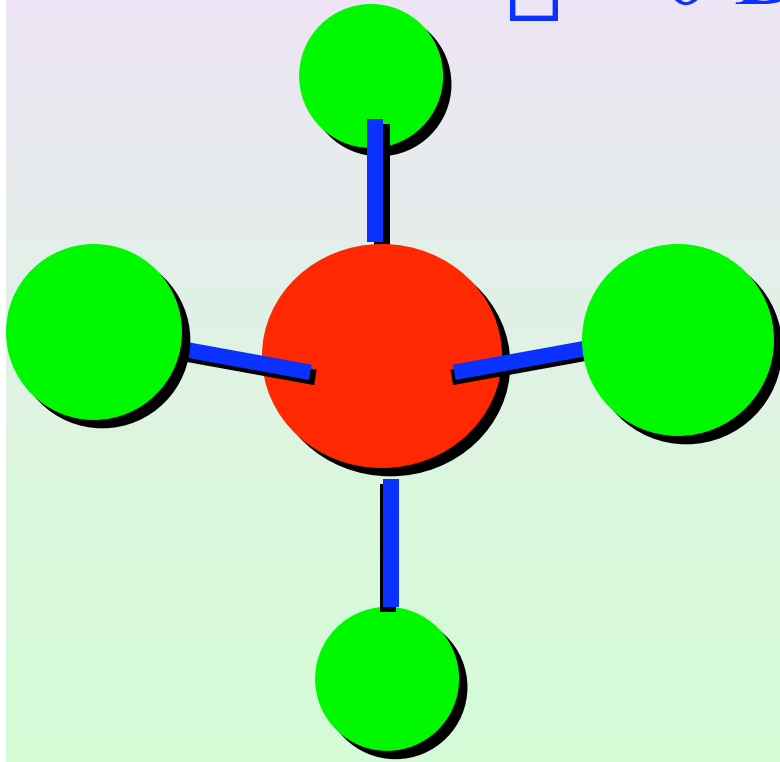


$\mu = 1.5 \text{ D}$

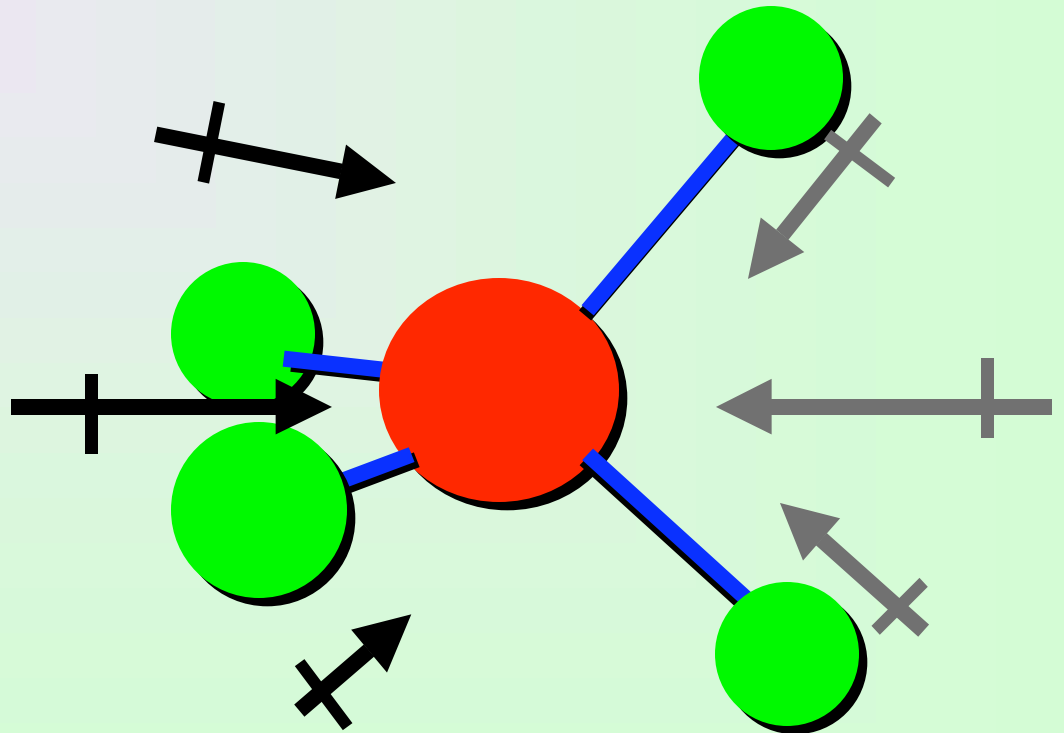
# More examples



$\square = 0 D$



$\square = 0 D$



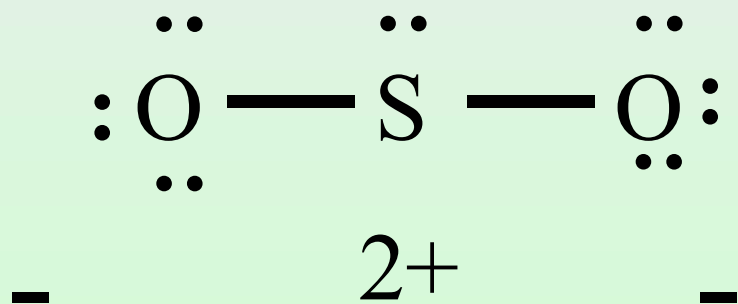
# Problem

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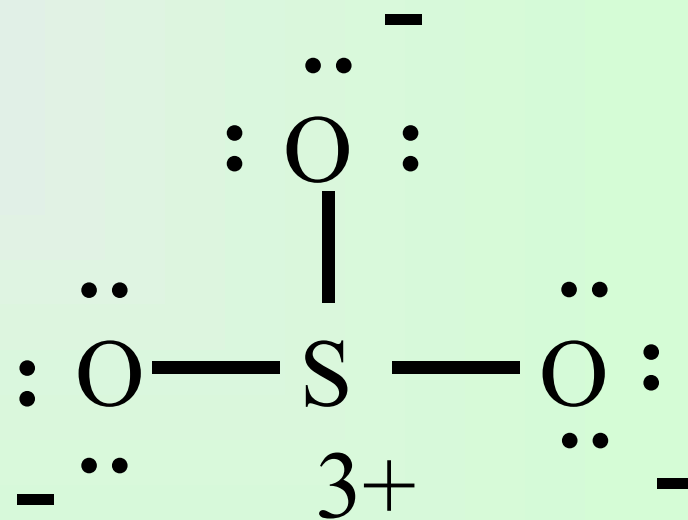
Which has the larger dipole moment, sulfur dioxide or sulfur trioxide?

First

Write Lewis structures for sulfur dioxide and sulfur trioxide



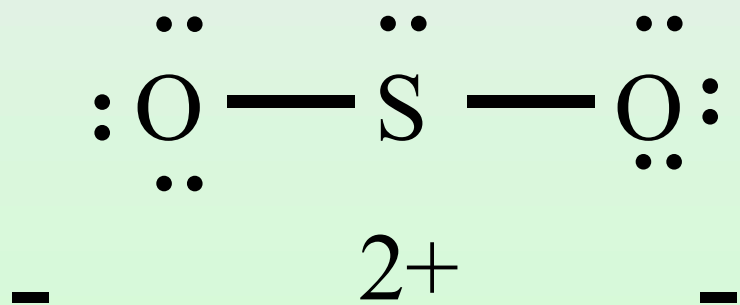
18 electrons



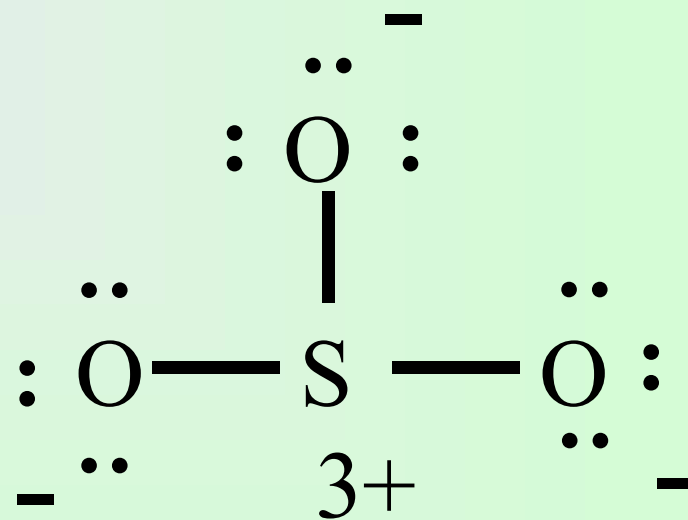
24 electrons

Next

Use VSEPR to deduce geometry



Three electron pairs



Three electron pairs

Next

Use VSEPR to deduce geometry

