

# [Vsepr - lab report example](https://assignbuster.com/vsepr-lab-report-example/)

## VSEPR

3 Lewis structures: Compound VSEPR formula Predicted bond angle (⁰) Polar? (yes/no) H2O MX2L2 104. 5 yes BeH2 MX2 180 no H2S MX2L2 91. 5 yes SO2 MX2L   
120   
yes   
BF3   
MX3   
120   
no   
NF3   
MX3   
120   
yes   
IF3   
MX3L2   
120   
yes   
CH4   
MX4   
109. 5   
no   
SF4   
MX4L   
120   
yes   
XeF4   
MX4L2   
90   
no   
PF5   
MX5   
120 and 90   
no   
SF6   
MX6   
90   
no   
3. 2. Equilibrium geometry:   
Compound   
Bond angle (⁰)   
Dipole moment (debye)   
Polar? (yes/no)   
H2O   
103. 98   
1. 86   
yes   
BeH2   
180   
0. 0   
no   
H2S   
93. 38   
0. 97   
yes   
SO2   
97. 90   
1. 62   
yes   
BF3   
120   
0. 0   
no   
NF3   
120   
0. 2   
yes   
IF3   
120   
1. 19   
yes   
CH4   
109. 47   
0. 0   
no   
SF4   
86. 36   
0. 632   
yes   
XeF4   
90   
0. 0   
no   
PF5   
90   
0. 0   
no   
SF6   
90   
0. 0   
no   
4. Analysis:   
In some compounds (BeH2, BF3, NF3, IF3, XeF4, PF5 and SF6) the bond angles were the same between the predictions made by inspecting their Lewis structures and analysing the results of their equilibrium structures. In SF4 and SO2 the bond angles between the two measurements differed by a big margin (22. 1⁰ for SO2 and 33. 64⁰ for SF4). In H2O, H2S and CH4 the difference was small (0. 52⁰ for H2O, 1. 88⁰ for H2S and 0. 03⁰ for CH­4).   
Because of these differences between the bond angles observed using Lewis structures and equilibrium geometry calculations, it is not possible to use only the direct inspection of Lewis structures to determine the bond angles of compounds. Polarities on the other hand can be determined by observing the Lewis structures. There are no changes in the polarities observed between the Lewis structures’ inspection and equilibrium geometry analysis.   
REFERENCE   
Kumar De, Anil. Textbook of Inorganic Chemistry. New Delhi: New Age International, 2003. Print.