

# [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.