

Exercises 7

Exercise 7.1

Predict the VSEPR geometry and polarity for the following molecules:

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|--------------------|-------------------|--------------------|---------------------|
| a) BeH_2 | b) BrF_3 | c) SeBr_2 | d) BrF_2^- |
| e) IF_5 | f) SO_2 | g) SiCl_4 | h) O_3 |
| i) PCl_3 | j) SBr_4 | k) ICl_3 | l) SbF_5 |
| m) SeCl_6 | n) XeF_4 | o) AlBr_3 | |

Exercise 7.2

Place the following molecules or ions in order of *decreasing* bond length:

- (a) the CO bond in CO , CO_2 , CO_3^{2-}
(b) the SO bond in SO_2 , SO_3 , SO_3^{2-}
(c) the CN bond in HCN , CH_2NH , CH_3NH_2 .

Explain your reasoning.

Exercise 7.3

What geometry can we expect for the following molecules: BeCl_2 , BF_3 , ClF_3 , XeF_4 and SF_6 ?

Exercise 7.4

Which do you predict to have the strongest CX bond, where X is a halogen: (a) CF_4 , (b) CCl_4 , or (c) CBr_4 ? Explain.

Exercise 7.5

Which do you predict to have the strongest CN bond: (a) NHCH_2 , (b) NH_2CH_3 , or (c) HCN ? Explain.