



Good break
to everyone!!

Chem 121

Take-home Quiz 5

Fall 09

NAME _____

score _____

COMPLETE and BRING in for the next class period (Monday after the break!)

SHOW ALL THE explanations asked .

Put letter answer in the space provided next to each question.

___ 1. Three of the four following species: XeF_4 , SiH_4 , ClO_4^- and NH_4^+ would be expected to have the same molecular geometry. What is this geometry?

A. square planar

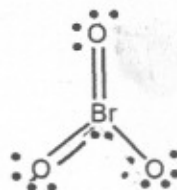
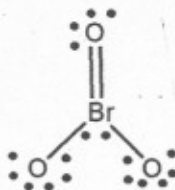
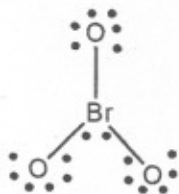
B. pyramidal

C. tetrahedral

D. see-saw

Sketch molecular geometry and name it for each compound listed above (follow the steps from worksheet question I!).

___ 2. The students in class proposed three Lewis structures for the BrO_3^- ion :



All three structures would result in the SAME molecular geometry. What is this geometry?

A. trigonal planar

B. tetrahedral

C. Pyramidal

D. T-shape

E. square planar



___ 3. Sketch the Lewis structure and molecular geometry for the NO_3^- ion.



What is the closest value of predicted ONO angle (put letter answer next to the question above)?

a. 60°

b. 90°

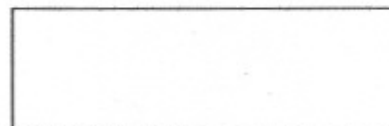
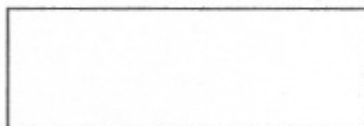
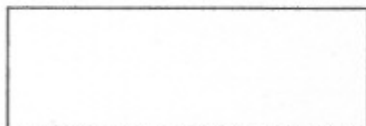
c. 109°

d. 120°

e. 180°

___ 4. Draw Lewis Structure for the $[\text{NCS}]^-$ ion (also called iso-thio-cyanide).

There are three possibilities of distributing single/double /triple bonds in this structure.



Consider all three and decide which one is more likely based on Formal Charge considerations.

(Reminder:

Formal Charge = group # - (all non-bonding electrons + 1/2 of all bonding electrons

The lowest formal charges lead to most probable structure. The total FC should add up to the charge of the species. When all else fails – the most likely structure will be the one with negative charge on most electronegative atom. For reference, EN for C is 2.55, N is 3.04, S is 2.58

grader _____

points lost _____