

NAME _____

For Lewis dot structures, if there is resonance you **must** indicate this!
Oxidation numbers must be preceded by a plus (+) or minus (-) sign!

$$\Delta x \Delta p = h \quad \lambda p = h \quad h = 6.62 \times 10^{-34} \text{ Js}$$

- 1) Draw the Lewis dot structure for H₂O.
- 2) Draw the Lewis dot structure for H₂CCH₂.
- 3) Draw the Lewis dot structure for SO₂.
- 4) Draw the Lewis dot structure for HCCH.
- 5) Draw the Lewis dot structure for CO₃²⁻.
- 6) Draw the Lewis dot structure for the PF₄⁻ ion.
- 7) An electron is confined to a space of 1.8 nm. What is the uncertainty in its momentum?
- 8) Give a set of possible quantum number for the highest energy electron for the ground state of an C atom
- 9) Give the **complete** electron configuration for the Si atom.
- 10) Give the electron configuration for the Si atom using the core designation.
- 11) Arrange the following atoms according to increasing electronegativity:
Cl, Fe, Al, Zr
- 12) Arrange the following atoms according to increasing atomic size: N, Ni, Si, Hf
- 13) What is the molecular geometry for the H₂S molecule?
- 14) What is the molecular geometry for the SF₆ molecule?
- 15) Which of the following is the rotation hindered and why?
FH₂CCH₂F, FHCCHF, FHCNF (note: There may be more than one.)
- 16) Why is the ionization energy of N greater than O?
- 17) What is the oxidation number of O in the compound CaO₂?
- 18) Name the compound Fe(ClO)₂. (Fe = iron)
- 19) Name the compound LiF.
- 20) Which has the greatest ionic radius? Ba²⁺, Y³⁺, Sc³⁺ or Ti⁴⁺

NAME _____

1)

2)

3)

4)

5)

6)

7) _____

8) $n =$ _____ , $l =$ _____ , $m_l =$ _____ , $m_s =$ _____

9) _____

10) _____

11) _____ < _____ < _____ < _____

12) _____ < _____ < _____ < _____

13) _____

14) _____

15) _____

16) _____

17) _____

18) _____

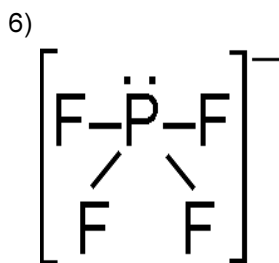
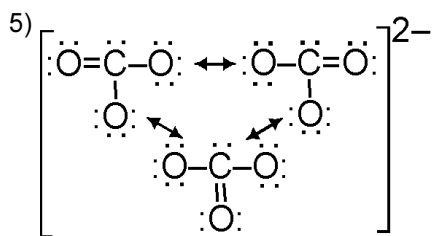
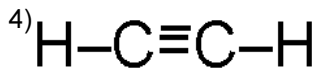
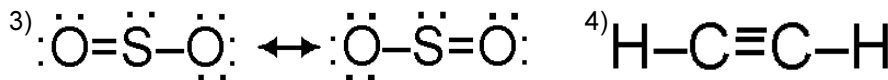
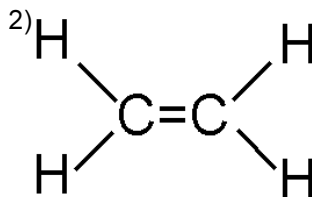
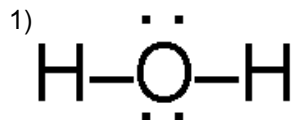
19) _____

20) _____

σ -bonds	lone pair electrons	hybrid	electronic geometry	molecular geometry
2	0	sp	linear	linear
2	1	sp ²	trigonal	bent 120°
3	0	sp ²	trigonal	trigonal
2	2	sp ³	tetrahedral	bent 108°
3	1	sp ³	tetrahedral	trigonal pyramid
4	0	sp ³	tetrahedral	tetrahedral
2	3	sp ³ d	trigonal bipyramid	linear
3	2	sp ³ d	trigonal bipyramid	T-shape
4	1	sp ³ d	trigonal bipyramid	sea-saw
5	0	sp ³ d	trigonal bipyramid	trigonal bipyramid
2	4	sp ³ d ²	octahedral	linear
3	3	sp ³ d ²	octahedral	T-shaped
4	2	sp ³ d ²	octahedral	square planar
5	1	sp ³ d ²	octahedral	square pyramid
6	0	sp ³ d ²	octahedral	ocatahedral

ions <i>acids</i>	hypo...ite <i>hypo...ous</i>	...ite <i>...ous</i>	...ate <i>...ic</i>	per...ate <i>per...ic</i>
chlor	ClO ⁻	ClO ₂ ⁻	ClO ₃ ⁻	ClO ₄ ⁻
brom	BrO ⁻	BrO ₂ ⁻	BrO ₃ ⁻	BrO ₄ ⁻
iod	IO ⁻	IO ₂ ⁻	IO ₃ ⁻	IO ₄ ⁻
sulf(<i>ur</i>)	SO ₂ ²⁻	SO ₃ ²⁻	SO ₄ ²⁻	
nitr		NO ₂ ⁻	NO ₃ ⁻	
phosph(<i>or</i>)	PO ₂ ³⁻	PO ₃ ³⁻	PO ₄ ³⁻	
carbon			CO ₃ ²⁻	

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7) 3.7×10^{-25}

8) $n = 2$, $l = 1$, $m_l = -1, 0, +1$, $m_s = \pm 1/2$

9) $1s^2 2s^2 2p^6 3s^2 3p^2$

10) $[\text{Ne}]3s^2 3p^2$

11) $\text{Zr} < \text{Fe} < \text{Al} < \text{Cl}$

12) $\text{N} < \text{Si} < \text{Ni} < \text{Hf}$

13) bent $\sim 108^\circ$

14) octahedral

15) FHCCHF and FHCNF both have double bonds and sp^2 hybridization

16) It is opposite the general trend. This is due to Hund's rule with the N half filling the p

This is a secondary stable configuration for N.

17) -1

18) iron II hypochlorite

19) lithium fluoride

20) Ba^{2+}