

Assignment # 2
Chemistry 211

1) True or False: All resonance structures are created equal. Explain your answer.

for $\text{O}=\text{N}-\text{O} \leftrightarrow \text{O}^-\text{N}=\text{O}^+$ negative charge is not shared equally.
example \therefore resonance structures are not equal.

2) What is the difference between a compound and a molecule?

all compounds are molecules but not all molecules are compounds. a compound is a molecule made of atoms from different elements.

3) What is an orbital?

a 3-D plot of the wave function where the probability of finding an electron is high.

4) How many electrons does carbon have? How many are valence electrons? What third-row element has the same number of valence electrons as carbon?

a) carbon $1s^2 2s^2 2p^2$ or 6 electrons

b) 4 valence electrons $2s^2 2p^2$

c) Silicon

5) Referring to the periodic table as needed, write electron configurations for all of the elements in the third period.

Na $3s^1$
Mg $3s^2$
Al $3s^2 3p^1$
Si $3s^2 3p^2$
P $3s^2 3p^3$
S $3s^2 3p^4$
Cl $3s^2 3p^5$
Ar $3s^2 3p^6$

(Neon) before 3s

6) Species that have the same number of electrons are described as isoelectronic. What +2 ion is isoelectronic with Na⁺? What -2 ion?

b)

a) Mg²⁺

b) O²⁻

7) Which of the following ions possess a noble gas configuration?

a) K⁺

b) He⁺

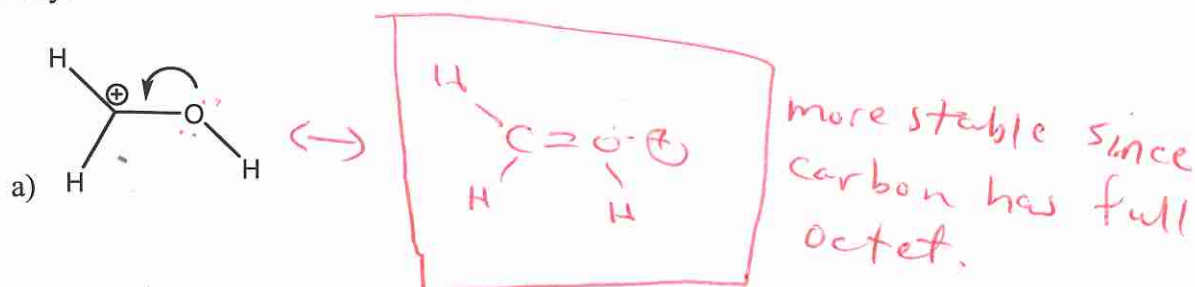
c) H⁻

d) O⁻

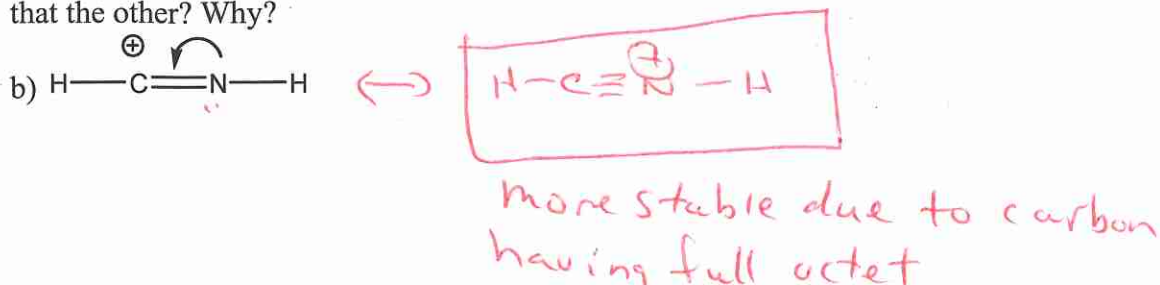
e) F⁻

f) Ca²⁺

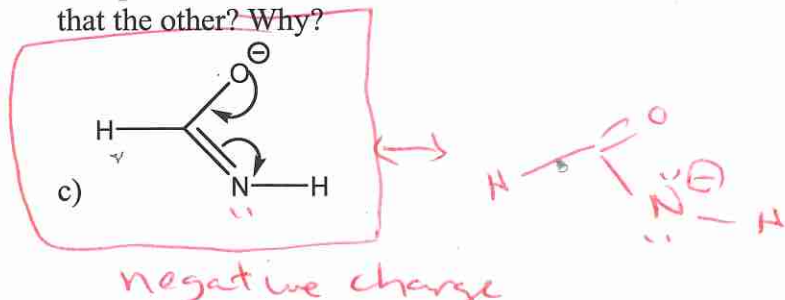
8) Write the resonance structure obtained by moving electrons as indicated by the curved arrows. Compare the stabilities of the two Lewis structures. Are the two structures equally stable or is one more stable than the other? Why?



Compare the stabilities of the two Lewis structures. Are the two structures equally stable or is one more stable than the other? Why?



Compare the stabilities of the two Lewis structures. Are the two structures equally stable or is one more stable than the other? Why?



negative charge
on more electronegative
oxygen so more stable

Compare the stabilities of the two Lewis structures. Are the two structures equally stable or is one more stable than the other? Why?



10) Listing the atoms in the order CHNOP, what is the molecular formula of ATP? How many unshared electron pairs does ATP have?

