PRS Review Session

March 17, 2006

Chem 111 2:30pm

The electronic configuration $1s^2 2s^2 2p^3$ represents which element?

1) B
2) C
3) N
4) O
5) F
6) Ne

The electronic configuration $1s^2 2s^2 2p^3$ represents which element?

1) B
2) C
3) N ←
4) O
5) F
6) Ne

Use the periodic table!

The electronic configuration $1s^2 2s^2 2p^3$ represents which ion?

1) O^{2-}
2) F^-
3) O^-
4) O^+
5) F^+
6) Ne^{2+}

The electronic configuration $1s^2 2s^2 2p^3$ represents which ion?

1) O^{2-}
2) F^-
3) O^-
4) O^+ ←
5) F^+
6) Ne^{2+}

Not likely to be very stable - why?

The electronic configuration $[Ar]4s^1$ represents which element/ion?

1) Cl
2) K
3) K^+
4) K^{2+}
5) K^-
6) Mg^{2+}

The electronic configuration $[Ar]4s^1$ represents which element/ion?

1) Cl $[Ne]3s^23p^5$
2) K ← $[Ar]4s^1$
3) K^+ $[Ar]$
4) K^{2+} $[Ne]3s^23p^5$
5) K^- $[Ar]4s^2$
6) Mg^{2+} $[Ar]$

Also Ar^-, Ca^+

Which has the highest effective nuclear charge?

1) B
2) C
3) N
4) O
5) F
6) Ne

Which has the highest effective nuclear charge?

1) B
2) C
3) N
4) O
5) F
6) Ne ←

All are n=2 level, Ne has highest nuclear charge, without going to the next n level

Which has the highest effective nuclear charge?

1) O^{2-}
2) F^{-}
3) O
4) F
5) Be
6) Be^{2+}

Which has the highest effective nuclear charge?

1) O^{2-}
2) F^-
3) O
4) F ←
5) Be
6) Be^{2+}

Highest nuclear charge, as before.
F^- has another electron, yielding a bit more electron-electron repulsion

Which has the largest atomic radius?

1) Mg
2) Al
3) Si
4) P
5) S
6) Cl

Which has the largest atomic radius?

1) Mg ←
2) Al
3) Si
4) P
5) S
6) Cl

All are n=3 level. Mg has the lowest effective nuclear charge - valence electrons held least tightly.

Which has the highest ionization potential?

1) C
2) N
3) O
4) F
5) Ne
6) Na

Which has the highest ionization potential?

1) C
2) N
3) O
4) F
5) Ne ←
6) Na

Has the highest effective nuclear charge, in the same row. Na has an electron at the next n level, so less tightly bound, despite higher total nuclear charge.

Which has the highest electron affinity?

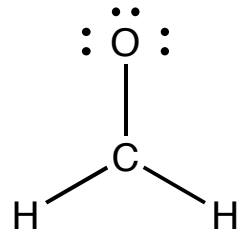
1) C
2) N
3) O
4) F
5) Ne
6) Na

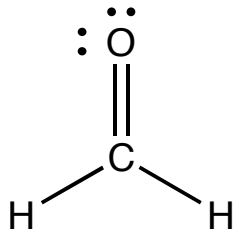
Which has the highest electron affinity?

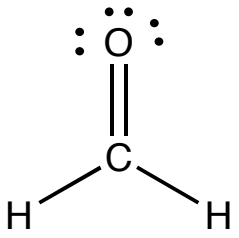
1) C
2) N
3) O
4) F ←
5) Ne
6) Na

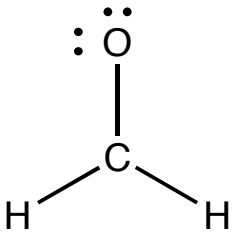
As before, but the **added electron** in Ne goes into the next n level.

Which represents a stable molecule?

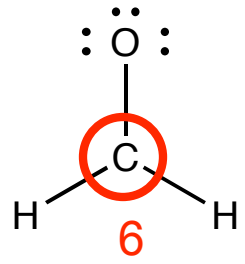
1) 

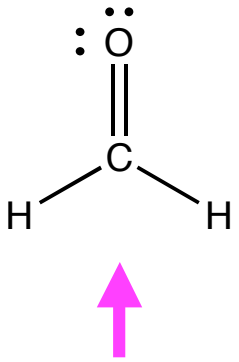
2) 

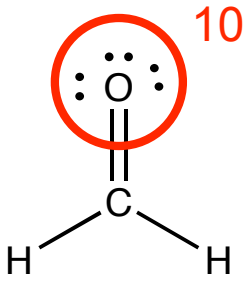
3) 

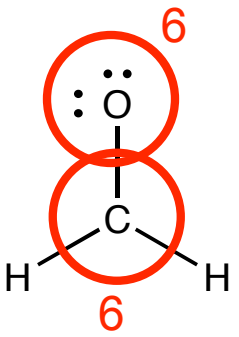
4) 

Which represents a stable molecule?

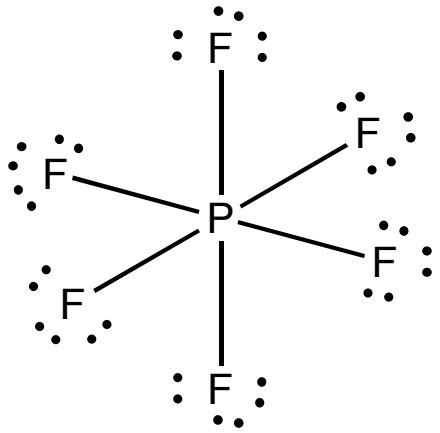
1) 

2) 

3) 

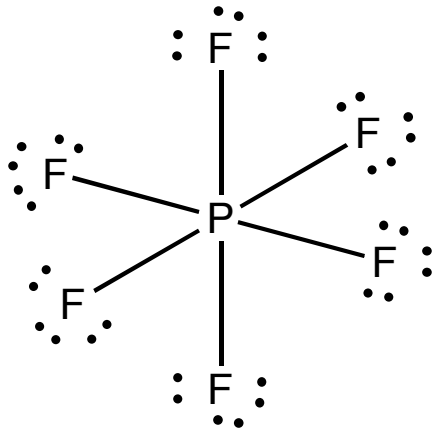
4) 

What is the charge on the following molecule?



1) -2
2) -1
3) 0
4) +1
5) +2

What is the charge on the following molecule?



1) -2
2) -1 ←
3) 0
4) +1
5) +2

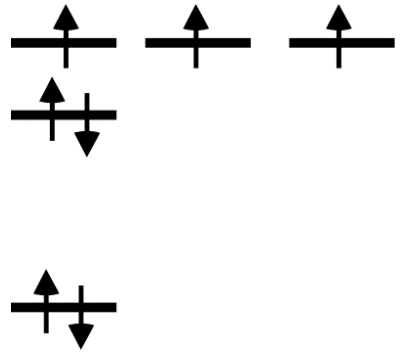
Total electrons = 6x6 + 2x6 = 48
"Should" be = 6x7 + 5 = 47
We'll see a faster way of doing the math in Chapt 10

Which of the following has the highest paramagnetism (sum of all m_s values)?

1) $1s^2 2s^2 2p^1$
2) $1s^2 2s^2 2p^2$
3) $1s^2 2s^2 2p^3$
4) $1s^2 2s^2 2p^4$
5) $1s^2 2s^2 2p^5$
6) $1s^2 2s^2 2p^6$

Which of the following has the highest paramagnetism (sum of all m_s values)?

1) $1s^2 2s^2 2p^1$
2) $1s^2 2s^2 2p^2$
3) $1s^2 2s^2 2p^3$ ←
4) $1s^2 2s^2 2p^4$
5) $1s^2 2s^2 2p^5$
6) $1s^2 2s^2 2p^6$



Which of the following is the electronic configuration of Fe^{3+} ?

1) $[Ar]3d^3$
2) $[Ar]3d^4$
3) $[Ar]3d^5$
4) $[Ar]4s^23d^3$
5) $[Ar]4s^23d^4$
6) $[Ar]4s^23d^5$

Which of the following is the electronic configuration of Fe^{3+} ?

1) $[Ar]3d^3$
2) $[Ar]3d^4$
3) $[Ar]3d^5$ ←
4) $[Ar]4s^23d^3$
5) $[Ar]4s^23d^4$
6) $[Ar]4s^23d^5$

Fe is $[Ar]3d^54s^2$

Remove from here first (highest energy)

Remove from here next