

Ions Guided Notes

- 1) What do we mean by a neutral atom?

Same number of protons, and electrons

- 2) Use Phosphorus and Sodium and mathematically show how they are neutral.

$$P = +15 - 15 = 0$$

(p) (e) (overall charge) ← neutral

$$Na = +11 - 11 = 0$$

- 3) How do atoms of an element achieve a full outer shell of 8 electrons? borrow electrons or ~~lend~~ lend electrons from other elements

- 4) What will happen to the overall charge of an atom if it gains or loses electrons? charge goes from "0" to either "+" or "-"
positive (give e) negative (borrow e)

- 5) **Consider Oxygen:** How many protons and electrons does a neutral atom of oxygen have?



- 6) How many valence electrons does oxygen have?

O has 6 valence electrons

- 7) Is "O" a M or NM?

- 8) Will "O" lend or borrow electrons? How many?

has 6 valence electrons, will borrow 2 more to reach happy "8"

- 9) If you borrow electrons you will have a negative charge.

Negative charge is called an anion. O^{2-}

- 10) Put it all together.... Write the symbol of the element with the charge!



- 11)



NM
 always
 borrow
 electrons

- 12) What does it mean when an ion has an overall negative charge? *borrowed, anion*

- 13) **Consider Aluminum:** How many protons and electrons does a neutral atom of aluminum have?

$$Al + 13 - 13 = 0$$

- 14) How many valence electrons does aluminum have?

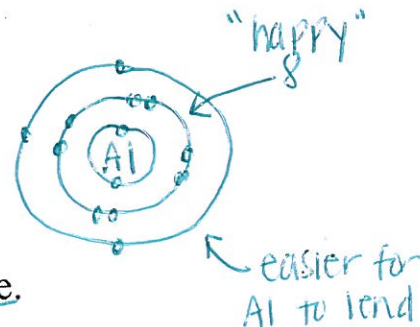
Al has 3 valence electrons $\cdot Al \cdot$

- 15) Is "Al" a M or NM?

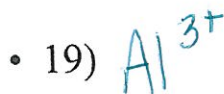
- 16) Will "Al" lend or borrow electrons? How many?

3 valence electrons

- 17) If you lend electrons you will have a positive charge. Positive charge is called a cation.

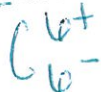


- 18) Put it all together.... Write the symbol of the element with the charge!



- 20) What does it mean when an ion has an overall positive charge? *cation, gave electrons away*

- 21) **Consider carbon:** How many protons and electrons does a neutral atom of carbon have?



- 22) How many valence electrons does carbon have?

4 valence electrons

- 23) Is "C" a M or NM?

- 24) Will "C" lend or borrow electrons? How many?

*
M
always
lend
electrons

- 25) If you borrow electrons you will have a negative charge. Negative charge is called **an anion**.
- 26) Put it all together.... Write the symbol of the element with the charge!
- 27) C^{4-}
- 28) What does it mean when an ion has an overall negative charge? *anion, borrowed electrons*

