ANSWER KEY

Ionization II

Name

Period

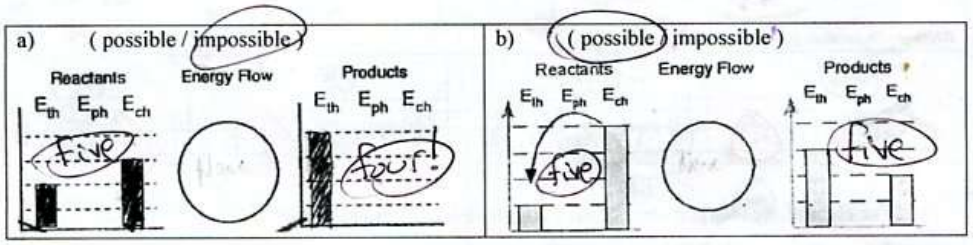
1. The Law of Conservation of Mass says that if nothing enters or leaves a system, the total MASS in that system must be the same before and after any change.
Based on this Law, mark the following as possible or not:

a) If a reaction of A + B → C + D (possible / impossible)
30g 14g → 40g 8g
44 48

b) If a reaction of W + X → Y + Z (possible / impossible)
14g 16g → 15g 15g
30 30

c) For a dissolving reaction: $Na_2CO_{3(s)} \rightarrow Na^+_{(aq)} + CO_3^{2-}{}_{(aq)}$ (possible / impossible)
two Sodium atoms; one sodium atom

2. The Law of Conservation of Energy says that if nothing enters or leaves a system, the total Energy in that system must be the same before and after any change.
Use this law to spot any fibs below:



3. The Law of Conservation of Charge is similar to the two laws above. It says that if nothing enters or leaves a system, the total CHARGE in that system must be the same before and after any change.

4. The Law of Conservation of Charge can help us spot wrongly written equations for ions.

a. $Ba + 2e^- \rightarrow Ba^{2+}$ possible / impossible — impossible because minus two ≠ plus two
b. $F \rightarrow F^+ + e^-$ possible / impossible — OKAY Because Zero = Zero
c. $S \rightarrow S^{2+} + 2e^-$ possible / impossible — OKAY Because Zero = +2 + −2
d. $I \rightarrow I^+ + e^-$ possible / impossible
e. $Ag + e^- \rightarrow Ag^+$ possible / impossible — impossible because 0 + (−1) ≠ (+1)

5. Write a balanced equation for neutral Mg losing two electrons (In the first blank, write Mg. You don't need to write the high low numbers, just the charge, if any):

$Mg \rightarrow Mg^{2+} + 2e^-$

6. Write a balanced equation for neutral chlorine atom gaining one electron:

$Cl + e^- \rightarrow Cl^-$

7. Write a balanced equation for a neutral boron atom losing three electrons:

$B \rightarrow B^{3+} + 3e^-$

8. Write a balanced equation for O^{2-} anion losing two electrons:

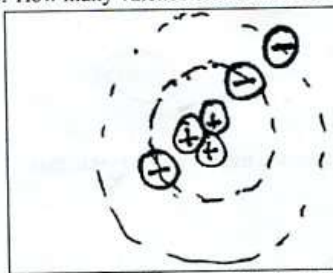
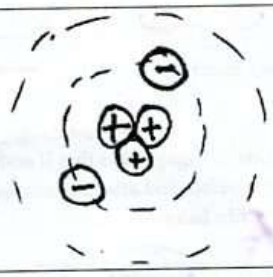
$O^{2-} \rightarrow O + 2e^-$

9. Write a balanced equation for Iron(III) ion gaining three electrons:

$3e^- + Fe^{3+} \rightarrow Fe$

Valence

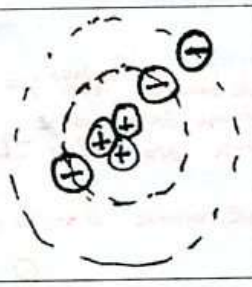
10. How many valence electrons does each atom below have?

	one
	two

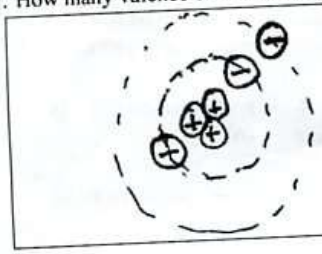
Below each particle group circle the total charge

11. 	12. 	13. 	14. 
(-2 / -1 / neutral / +1 / +2)	(-2 / -1 / neutral / +1 / +2)	(-2 / -1 / neutral / +1 / +2)	(-2 / -1 / neutral / +1 / +2)

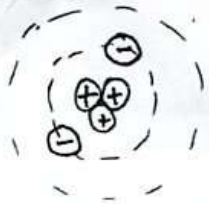
15. For electrically charged objects, the two principles of attraction are:
    - attraction decreases with distance
    - attraction decreases when charge decreases

	16. In this drawing of an atom the particles are labeled with their charges. This atom contains 3 electrons, 3 protons, and zero neutrons.

17. How many valence electrons does each atom below have?

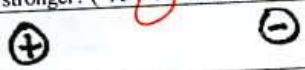


one



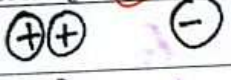
two

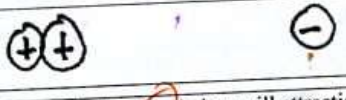
18. In which situation below will attraction be stronger? (A / B / no difference)

a) 

b) 

19. In which situation below will attraction be stronger? (A / B / no difference)

a) 

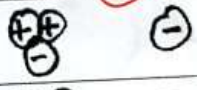
b) 

20. In which situation below will attraction be stronger? (A / B / no difference)

a) 

b) 

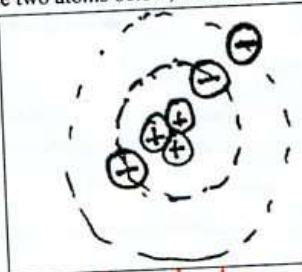
21. In which situation below will attraction be stronger? (A / B / no difference)

a) 

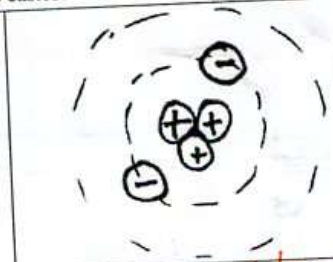
b) 

22. To remove an **electron** from an atom we have to pull hard enough to overcome the attraction of the atom's **nucleus**. On the two atoms below, which has a valence electron that is easiest to remove? (A / B)

A



B



"A" should be easier to remove a valence electron because it is farther from the positive nucleus.