GLY 4200C NAME_____
HOMEWORK 4

Ionic Valance in Mineral Formulas

Guidelines:

In mineral formulas, the following guidelines are useful in determining the valance of an ion.

1. Oxygen ions have a charge of -2

2. Alkali metals ions and hydrogen have a charge of +1

3. Alkaline earth ions have a charge of +2

4. Halogen ions have a charge of -1

5. Sulfur anion has a charge of -2, in sulfide minerals
   Exception: When sulfur is present as the S_2 dimer, it has a charge of -1

6. Silicon is usually +4

7. Aluminum is usually +3

8. Water molecules, ammonia (NH_3) and carbon dioxide (CO_2) are neutral, so there presence in a mineral formula may be ignored

Applying these guidelines allows the determination of the unknown valance state of ions in most minerals:

Example: What is the charge on Mn in rhodonite, $MnSiO_3$?

Solution: Oxygen is -2, so three oxygens are -6
Silicon is +4, so SiO_3 is -2
Therefore, Mn is +2

Apply the guidelines to solve the unknown valance state of the minerals on the back side of this sheet.

Mineral or group	**Formula**	**Ion**	**Charge on ion** (List numerical charge)
1. Klockmannite	$CuSe$	Cu	_____
2. Stainierite	$CoO(OH)$	Co	_____
3. Baddeleyite	ZrO_2	Zr	_____
4. Epsomite	$MgSO_4 \cdot 7H_2O$	S	_____
5. Chlorothionite	$K_2Cu(SO_4)Cl_2$	Cu	_____
6. Adelite	$CaMg(AsO_4)F$	As	_____
7. Vanadinite	$Pb_5(VO_4)_3Cl$	V	_____
8. Pintadoite	$Ca_2V_2O_7 \cdot 9H_2O$	V	_____
9. Rammelsbergite (Hint: H = 5.5-6)	$NiAs_2$	As	_____
10. Schwartzembergite	$Pb_5(IO_3)Cl_3O_3$	I	_____