

Chemistry 51

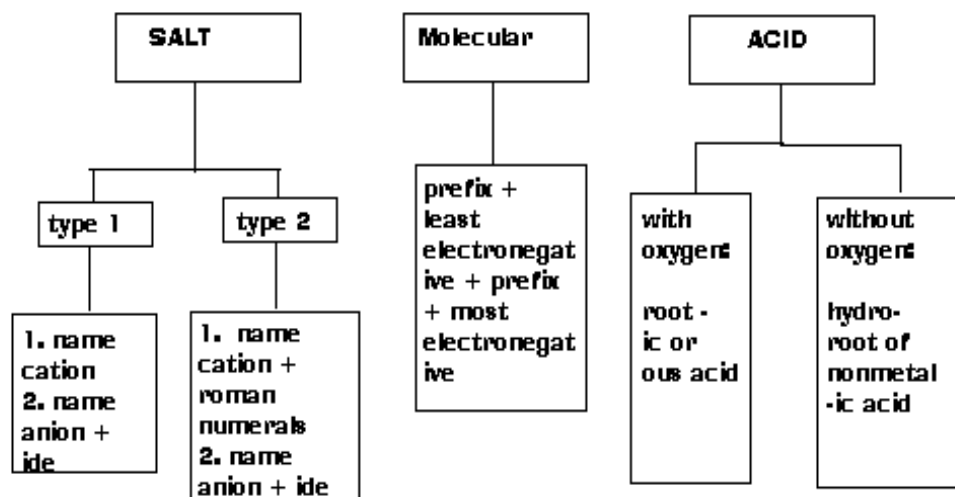
Experiment 6

Nomenclature

RULES FOR CONSTRUCTING LEWIS DOT FORMULAS

Introduction:

The ability to *write* chemical formulas and correctly *name* chemical compounds is vital to the study of chemistry. This section will provide you with practice to help you acquire this ability. Remember to determine the type of compound before attempting to name the compound.



When naming chemical compounds, first determine the type of compound. Is it IONIC (a metal & nonmetal), MOLECULAR (nonmetals only) or an ACID (hydrogen salt in water)? Remember, an ionic species is composed of a metal + a nonmetal. A molecular species is composed of two or more nonmetals. An acid generally begins with "H".

If the compound is an ionic species, determine if the cation is of type 1 (has only one possible oxidation state or charge) or type 2 (has multiple oxidation states or charges). Follow the rules pertaining to each type. The IUPAC rules are given here. Remember to keep the roman numerals in parenthesis. Also remember that the -ide ending is only used with monatomic anions. The polyatomic anions will have the -ate or -ite ending. Consult your textbook for the listing of polyatomic anions.



Cesium is found in Group I so it can only have a positive (+) one charge, calcium is found in Group II so it can only have a positive (+) two charge, and lastly cerium is a lanthanide and can have different oxidation states (charges). The roman numerals must be used when naming cerium compounds in order to differentiate between the different possible oxidation states.

If the compound is molecular then use the following greek prefixes.

1 = mono	3 = tri	5 = penta	7 = hepta	9 = nona
2 = di	4 = tetra	6 = hexa	8 = octa	10 = deca

Do not use the prefix mono for the first component. **CO is called carbon monoxide. N₂O₅ is called dinitrogen pentoxide**

If the compound is in water and it contains hydrogen (in front) then this species is an acid. First check to see if the acid contains oxygen or not. There are two different rules to follow depending on the presence of oxygen. If the species is an oxyacid and has the relatively higher oxidation state, it is named as "*root of nonmetal - ic acid*". If the nonmetal of the oxyacid has the lower oxidation state then it is named by "*root of nonmetal - ous acid*".

HI = hydroiodic acid

HIO₃ = iodic acid

HIO₂ = iodous acid

A. Write chemical formulas for the following compounds:

1. Potassium chloride

2. Barium sulfate

3. Aluminum nitrate

4. Copper (II) carbonate

5. Iron (III) chloride

6. Magnesium Hydroxide

7. Lead (II) oxide

8. Nickel (II) hydroxide

9. Mercury (II) bromide

10. Ammonium sulfide

11. Magnesium chlorate

12. Sodium hydroxide

13. Manganese (II) phosphate

14. Silver acetate

15. Platinum(IV) fluoride

16. Chromium (III) hydroxide

17. Calcium carbonate

18. Antimony trichloride

19. Ammonia

20. Silicon dioxide

21. Carbon monoxide

22. Hydrobromic acid

23. Nitrous acid

24. Acetic acid

25. Sulfuric acid

B. Give a correct chemical name for each of the following compounds:

1. MgO _____
2. PbI₂ _____
3. FeS _____
4. ZnSO₄ _____
5. Li₂CO₃ _____
6. Ba(NO₃)₂ _____
7. NH₄NO₂ _____
8. K₂SO₄ _____
9. CrCl₃ _____
10. Ca(C₂H₃O₂)₂ _____
11. MgO _____
12. Ca₃(PO₄)₂ _____
13. PbO₂ _____
14. KMnO₄ _____
15. BaCl₂ _____
16. NaHCO₃ _____
17. CCl₄ _____
18. NO₂ _____
19. N₂O₄ _____
20. PBr₃ _____
21. HCl(aq) _____
22. HNO₃(aq) _____
23. H₂SO₃(aq) _____
24. H₃PO₄(aq) _____
25. H₂O _____