group 1	+1	$1e^-$
group 2	+2	$2e^-s$
group 13	+3	$3e^-s$
group 14	+/- 4	$4e^-s$
group 15	-3	$5e^-s$
group 16	-2	$6e^-s$
group 17	-1	$7e^-s$
group 18	0	$8e^-s$

$+11$ $\quad 1s^2 2s^2 2p^6 3s^1$

-11 $\quad 1s^2 2s^2 2p^6 3s^2 3p^6$

0 $\quad 1s^2 2s^2 2p^6$

$+11$

-10

$+1$

metal + nonmetal =
an ionic bond due
to the transfer of e^-s.
metals have + charges
nonmetals have - charges
ionic bonds = salts

chlorine

$NaCl$ sodium chloride

Na^{+1} Cl^{-1} $+1-1=0$

Mg^{+2} F^{-1}

F^{-1}

magnesium fluoride

MgF_2

Mg^{+2} S^{-2}

MgS magnesium sulfide

$Mg^{+2}O^{-2}$

MgO magnesium oxide

K^{+1} N^{-3}

K^{+1}

K^{+1}

K_3N potassium nitride

Al^{+3} S^{-2} aluminum sulfide

Al^{+3} S^{-2}

S^{-2}

Al_2S_3

Rb^{+1} O^{-2}

Rb^{+1}

Rb_2O

Robidium oxide

Ca^{+2} 20 20 18

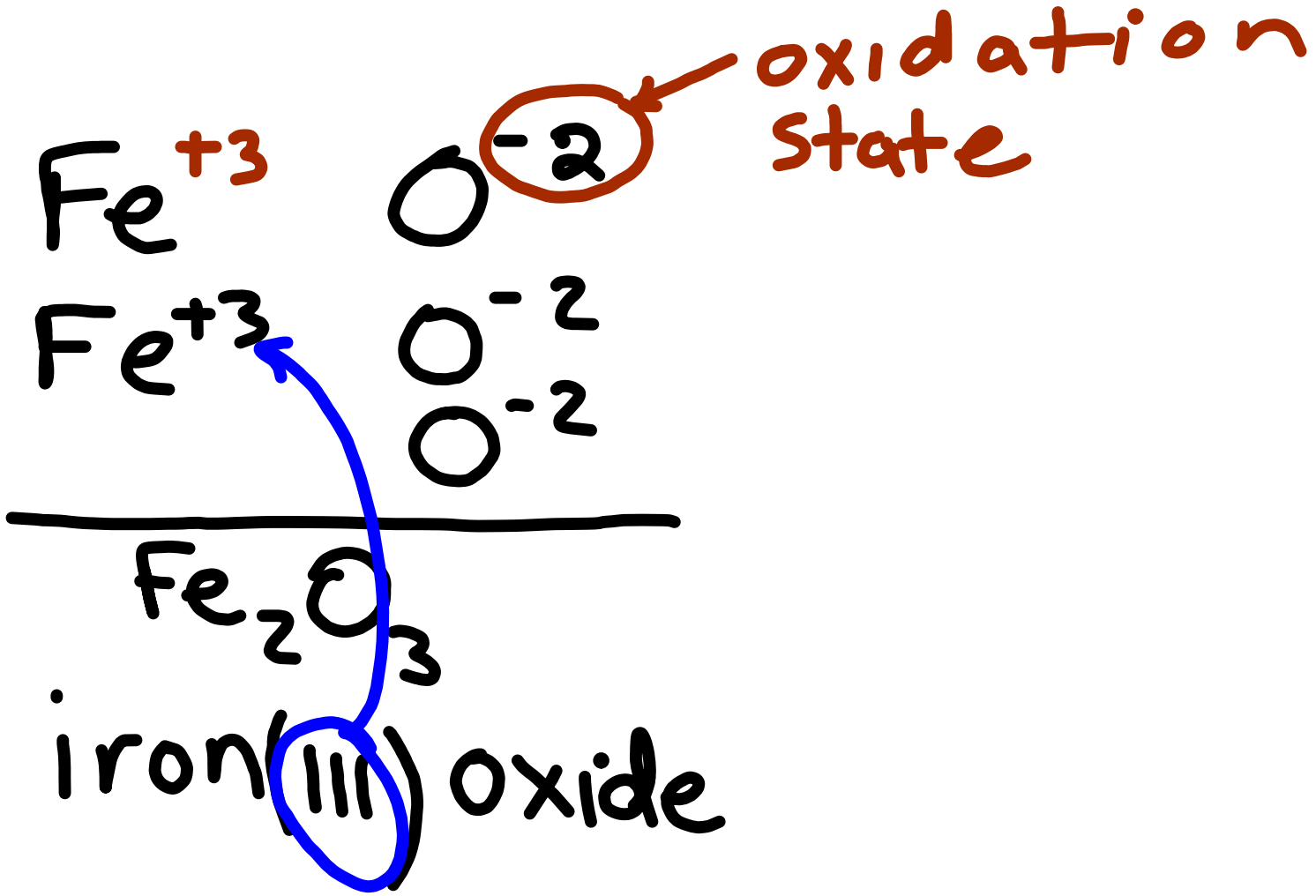
$+20$

-18

$+2$

Pd^{+2} 46 46 44 2+

$$+46$$
$$-44$$
$$\overline{\qquad\qquad}$$
$$+2$$


oxidation state
Fe+3
O-2
Fe+3
O-2
O-2
Fe2O3
iron(III) oxide

Transition metals
and Zn, Cd, Hg,
Ga, In, Sn, Pb
Bi have more than one
ion ~~state~~ so you must
use a roman numeral.

Pb^{+4} Cl^{-1} Cl^{-1} Cl^{-1} Cl^{-1}

lead(IV) chloride

$PbCl_4$

All metals have a + charge

All non metals have a negative charge

Ca^{+2} F^{-1} F^{-1}

CaF_2

Calcium fluoride

Element Symbols

1. First letter is always capitalized.
2. If there is a second letter, the letter is lower case.

Cq

K^{+1} S^{-2}

K^{+1}

K_2S

potassium sulfide

Polyatomic ions

many atoms that make up an ion.

p124

NO_3^- nitrate

PO_4^{-3} phosphate

CO_3^{-2} carbonate

SO_4^{-2} sulfate

HCO_3^- bicarbonate

CH_3COO^-, $C_2H_3O_2^-$ } acetate

OH^- hydroxide

NH_4^+ ammonium

CN^- cyanide

Mg^{+2} OH^- OH^-

~~MgO_2H_2~~

$Mg(OH)_2$

magnesium hydroxide

Ni^{+2} PO_4^{-3}

Ni^{+2} PO_4^{-3}

Ni^{+2}

$Ni_3(PO_4)_2$

Nickel (II) phosphate

Ca^{+2} HCO_3^{-1}

HCO_3^{-}

$Ca(HCO_3)_2$

calcium bicarbonate

Cs^+ NO_3^-

$CsNO_3$

$Cs(NO_3)$

Cesium nitrate

NH_4^+ OH^-

NH_4OH

ammonium hydroxide

$(NH_4)(OH)$

Zn^{+2} PO_4^{-3}

Zn^{+2} PO_4^{-3}

Zn^{+2}

$Zn_3(PO_4)_2$

Zinc(II) phosphate

p122

4.15, 4.21

p127-128

4.31, 4.33, 4.35

Electron configuration of an element

Weighted average of an element

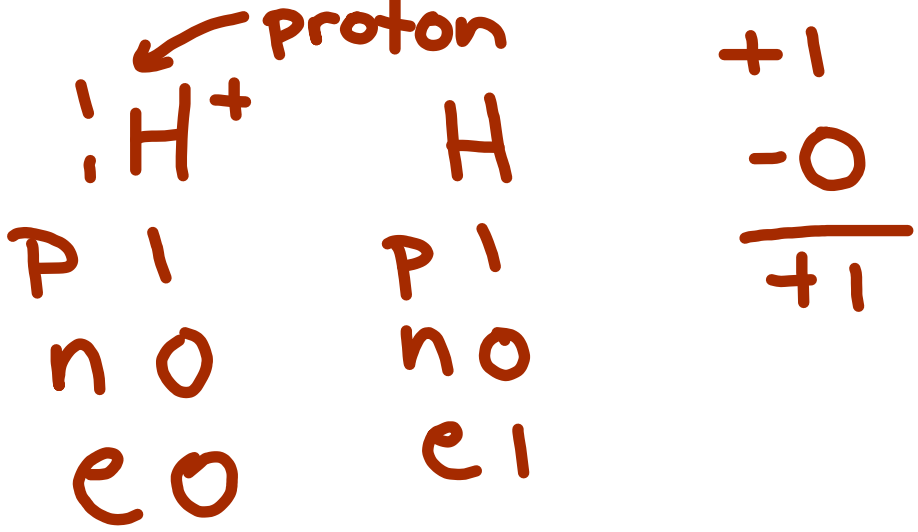
HCl

hydrogen chloride

hydrochloric acid

binary acid

2 elements of which one is a H^+



HBr H^+ Br^{-1}

hydrogen bromide

hydrobromic acid

HF H^+ F^-

hydrofluoric acid

HI H^+ I^-

hydroiodic acid

Vanadium(V) oxide

V^{+5} V^{+5}

O^{-2} O^{-2} O^{-2} O^{-2} O^{-2}

V_2O_5

P 144

4.17

4.75

4.77

4.79

4.81

4.83

4.101

4.106

KI

potassium iodide

NH_4Cl

ammonium chloride

$Cu(NO_3)_2$

copper(II) nitrite

Cu^{+2} NO_3^- NO_3^-

$Ba(OH)_2$

Cu_2S Cu^{+1} Cu^{+1} S^{-2}

Copper(I) sulfide

CuS Cu^{+2} S^{-2}

Copper(II) sulfide

OH^- NO_2^- CO_3^{-2}

Cu^{+2} $Cu(OH)_2$ $Cu(NO_2)_2$ $CuCO_3$

HSO_4^- PO_4^{-3}

Cu^{+2} $Cu(HSO_4)_2$ $Cu_3(PO_4)_2$

HF hydrofluoric acid

HCl hydrochloric acid

HBr hydrobromic acid

HI hydroiodic acid

H^+ → acid

X^- → halogen

H^+ PO_4^{-3}

H^+

H^+

H_3PO_4

phosphoric acid

H^+ SO_4^{-2}

H^+

H_2SO_4

sulfuric acid

H^+ CO_3^{-2}

H^+

H_2CO_3

Carbonic acid

H^+ NO_3^-

HNO_3

nitric acid

HCN

cyanic acid

CH_3COO^{-1} H^+

$HOOCCH_3$

acetic acid

Vinegar

Covalent bonds -
Sharing of electrons
nonmetals/nonmetals

Carbon monoxide

CO 1

CO_2

Carbon dioxide

2

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

NO nitrous oxide
laughing gas

nitrogen monoxide

$2\,NO_2$ NO_x

nitrogen dioxide

N_2O_4

dinitrogen tetroxide

P_2O_5

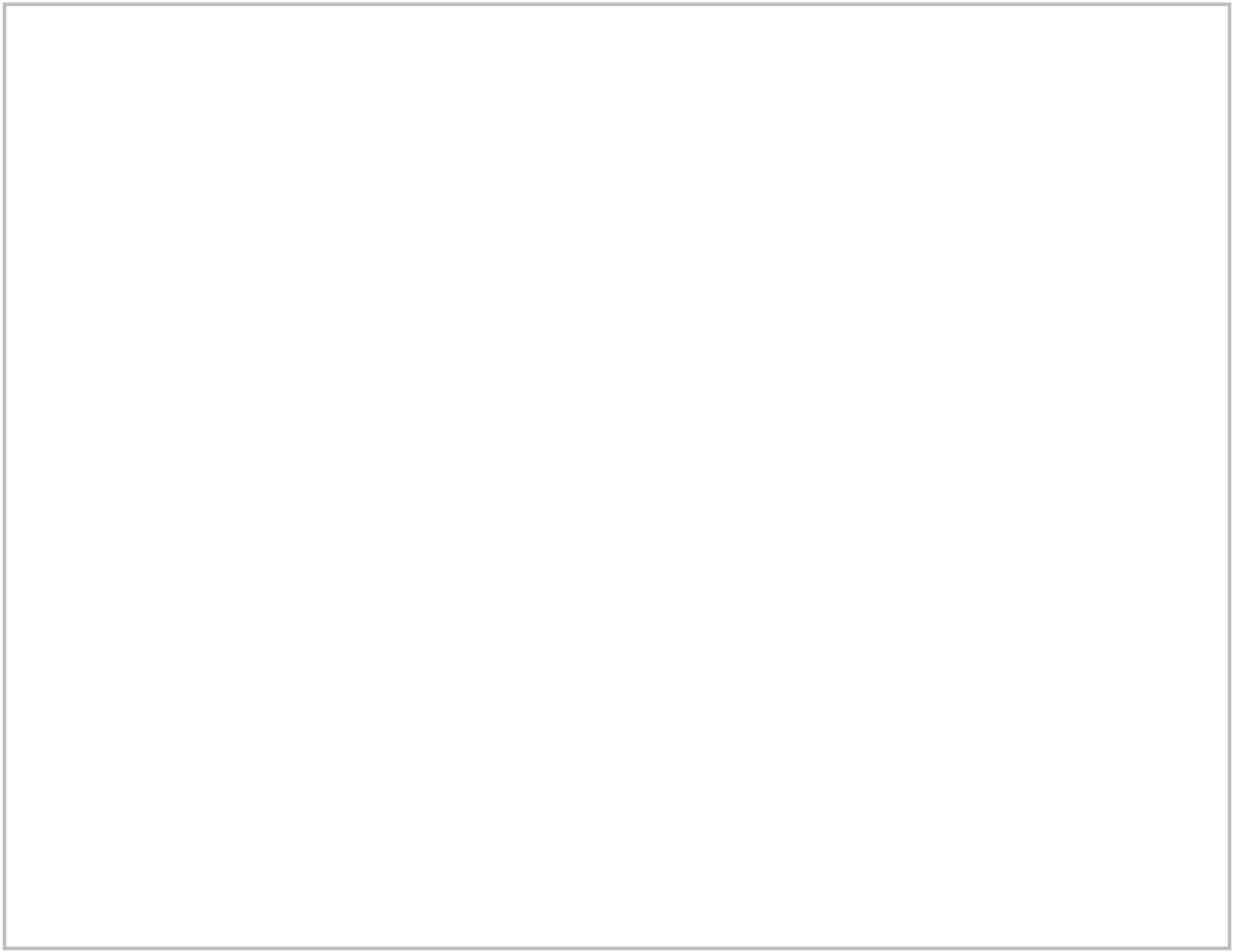
diphosphorus pentoxide

N_2

nitrogen

$O_2, O_3, F_2, Cl_2, Br_2,$

I_2, H_2



Title: Oct 10 - 10:00 AM (45 of 45)