CHEMISTRY REFERENCE SHEET – Mrs. Bauck

POLYATOMIC IONS

Chemistry 1 Honors students must memorize these 28 ions.
Chemistry 1 students must memorize 21 ions (delete the seven marked with ***).

+1 CHARGE:

ammonium $(NH_4)^+$

-1 CHARGE:

acetate
$(C_2H_3O_2)^-$ or $(CH_3COO)^-$

bicarbonate or
hydrogen carbonate $(HCO_3)^-$

*** bisulfate or
hydrogen sulfate $(HSO_4)^-$

*** bromate $(BrO_3)^-$

chlorate $(ClO_3)^-$

chlorite $(ClO_2)^-$

cyanide $(CN)^-$

hydroxide $(OH)^-$

hypochlorite $(ClO)^-$

nitrate $(NO_3)^-$

nitrite $(NO_2)^-$

perchlorate $(ClO_4)^-$

permanganate $(MnO_4)^-$

*** thiocyanate $(SCN)^-$

-2 CHARGE:

carbonate $(CO_3)^{-2}$

*** carbonite $(CO_2)^{-2}$

chromate $(CrO_4)^{-2}$

dichromate $(Cr_2O_7)^{-2}$

*** oxalate $(C_2O_4)^{-2}$

silicate $(SiO_3)^{-2}$ [or $(SiO_4)^-$]

sulfate $(SO_4)^{-2}$

sulfite $(SO_3)^{-2}$

*** thiosulfate $(S_2O_3)^{-2}$

-3 CHARGE:

*** arsenate $(AsO_4)^{-3}$

phosphate $(PO_4)^{-3}$

phosphite $(PO_3)^{-3}$

COMMON ACIDS

Students must know these acids and how to dissociate them.
These are skeleton equations.
(Chemistry IH will have more acids to name.)

acetic acid	$HC_2H_3O_2$	$HC_2H_3O_2\ (aq) \rightarrow H^+\ (aq) + (C_2H_3O_2)^-\ (aq)$
	or CH_3COOH	$CH_3COOH\ (aq) \rightarrow H^+\ (aq) + (CH_3COO)^-\ (aq)$
carbonic	H_2CO_3	$H_2CO_3\ (aq) \rightarrow H^+\ (aq) + (CO_3)^{-2}\ (aq)$
hydrochloric	HCl	$HCl\ (aq) \rightarrow H^+\ (aq) + Cl^-\ (aq)$
nitric	HNO_3	$HNO_3\ (aq) \rightarrow H^+\ (aq) + (NO_3)^-\ (aq)$
phosphoric	H_3PO_4	$H_3PO_4\ (aq) \rightarrow H^+\ (aq) + (PO_4)^{-3}\ (aq)$
sulfuric	H_2SO_4	$H_2SO_4\ (aq) \rightarrow H^+\ (aq) + (SO_4)^{-2}\ (aq)$

THE SEVEN DIATOMIC MOLECULES ("Super Seven")

diatomic when alone, uncombined with other symbols

H_2 F_2 O_2 N_2 Cl_2 Br_2 I_2

"MIDDLE METALS"

Ions of transition elements need Roman numerals, EXCEPT
Ag^{+1}, Cd^{+2}, Zn^{+2}

Pb and Sn have ionic charges of +2 and +4

COMMON CHARGES (OXIDATION NUMBERS)

"Charge Chant": +1 +2 +3 mixed -3 -2 -1 0
+2 in the middle, unless they tell you otherwise

Group number:	**IA**	**IIA**	**IIIA**	**IVA**	**VA***	**VIA***	**VIIA***	**VIIIA**
	1	**2**	**13**	**14**	**15**	**16**	**17**	**18**
Main ionic charge:	**+1**	**+2**	**+3**	**M**	**-3**	**-2**	**-1**	**none**

M most of Group IVA (14) don't usually form ions; when they do, mixed charges are possible
* when applicable