

## Inorganic compounds

Here we present a list of simple inorganic compounds whose knowledge is required for the credit tests ending the winter semester medical chemistry courses in the first year English class, programs general medicine and dentistry. The purpose of the list is to state explicitly what we consider as the 'background' knowledge for the nomenclature, ionic equations, calculation tasks etc. contained in the test; but is not intended as any substitute for course information on biomedically significant inorganic compounds.

### 1. Oxides:

<i>Formula</i>	<i>English name</i>
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
N <sub>2</sub> O	dinitrogen oxide, nitrogen(I) oxide, nitrous oxide
NO	nitrogen oxide, nitrogen(II) oxide, nitric oxide
NO <sub>2</sub>	nitrogen dioxide, nitrogen(IV) oxide
N <sub>2</sub> O <sub>5</sub>	dinitrogen pentaoxide, nitrogen(V) oxide
SO <sub>2</sub>	sulfur dioxide, sulfur(IV) oxide, sulfurous oxide
SO <sub>3</sub>	sulfur trioxide, sulfur(VI) oxide, sulfuric oxide
CaO	calcium oxide (lime)
MgO	magnesium oxide
Al <sub>2</sub> O <sub>3</sub>	aluminium oxide (alumina)
SiO <sub>2</sub>	silicon dioxide, silicon(IV) oxide (silica)
ZnO	zinc oxide
Cu <sub>2</sub> O	copper(I) oxide, cuprous oxide
CuO	copper(II) oxide, cupric oxide
FeO	iron(II) oxide, ferrous oxide
Fe <sub>2</sub> O <sub>3</sub>	iron(III) oxide, ferric oxide
CrO <sub>3</sub>	chromium trioxide, chromium(VI) oxide
MnO <sub>2</sub>	manganese dioxide, manganese(IV) oxide
Mn <sub>2</sub> O <sub>7</sub>	dimanganese heptoxide, manganese(VII) oxide

### 2. Peroxides:

<i>Formula</i>	<i>English name</i>
H <sub>2</sub> O <sub>2</sub>	hydrogen peroxide

### 3. Hydroxides:

<i>Formula</i>	<i>English name</i>
NaOH	sodium hydroxide
KOH	potassium hydroxide
Ca(OH) <sub>2</sub>	calcium hydroxide
Ba(OH) <sub>2</sub>	barium hydroxide
Al(OH) <sub>3</sub>	aluminium hydroxide
Fe(OH) <sub>2</sub>	iron(II) hydroxide, ferrous hydroxide
Fe(OH) <sub>3</sub>	iron(III) hydroxide, ferric hydroxide
Cu(OH) <sub>2</sub>	copper hydroxide
NH <sub>4</sub> OH	ammonium hydroxide (aqueous ammonia)

#### 4. Hydracids:

<i>Formula</i>	<i>English name</i>
HF	hydrofluoric acid, hydrogen fluoride
HCl	hydrochloric acid, hydrogen chloride
HBr	hydrobromic acid, hydrogen bromide
HI	hydroiodic acid, hydrogen iodide
HCN	hydrocyanic acid, hydrogen cyanide
H <sub>2</sub> S	hydrosulfuric acid, hydrogen sulfide

#### 5. Oxoacids and thioacids:

<i>Formula</i>	<i>English name</i>
H <sub>3</sub> BO <sub>3</sub>	boric acid
H <sub>2</sub> CO <sub>3</sub>	carbonic acid
HOCN	cyanic acid
HSCN	thiocyanic acid
HNO <sub>2</sub>	nitrous acid
HNO <sub>3</sub>	nitric acid
H <sub>3</sub> PO <sub>4</sub>	phosphoric acid
H <sub>2</sub> SO <sub>3</sub>	sulfurous acid
H <sub>2</sub> SO <sub>4</sub>	sulfuric acid
H <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	thiosulfuric acid
HClO	hypochlorous acid
HClO <sub>2</sub>	chlorous acid
HClO <sub>3</sub>	chloric acid
HClO <sub>4</sub>	perchloric acid
H <sub>2</sub> CrO <sub>4</sub>	chromic acid
H <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	dichromic acid
HMnO <sub>4</sub>	permanganic acid

#### 6. Salts:

Salts are binary compounds. Various combinations of anions (derived from an acid), and cations (typically a metal, derived from a metal hydroxide) listed below should be considered.

ANIONS		
<i>Formula</i>	<i>English name</i>	<i>Charge</i>
F <sup>-</sup>	fluoride	-1
Cl <sup>-</sup>	chloride	-1
Br <sup>-</sup>	bromide	-1
I <sup>-</sup>	iodide	-1
CN <sup>-</sup>	cyanide	-1
S <sup>2-</sup>	sulfide	-2
HS <sup>-</sup>	hydrogen sulfide	-1
CO <sub>3</sub> <sup>2-</sup>	carbonate	-2
HCO <sub>3</sub> <sup>-</sup>	hydrogen carbonate	-1
OCN <sup>-</sup>	cyanate	-1
SCN <sup>-</sup>	thiocyanate (rhodanide)	-1

$\text{NO}_2^-$	nitrite	-1
$\text{NO}_3^-$	nitrate	-1
$\text{PO}_4^{3-}$	phosphate (tertiary phosphate)	-3
$\text{HPO}_4^{2-}$	hydrogen phosphate (secondary phosphate)	-2
$\text{H}_2\text{PO}_4^-$	dihydrogen phosphate (primary phosphate)	-1
$\text{SO}_3^{2-}$	sulfite	-2
$\text{HSO}_3^-$	hydrogen sulfite	-1
$\text{SO}_4^{2-}$	sulfate	-2
$\text{HSO}_4^-$	hydrogen sulfate	-1
$\text{S}_2\text{O}_3^{2-}$	thiosulfate	-2
$\text{ClO}^-$	hypochlorite	-1
$\text{ClO}_2^-$	chlorite	-1
$\text{ClO}_3^-$	chlorate	-1
$\text{ClO}_4^-$	perchlorate	-1
$\text{CrO}_4^{2-}$	chromate	-2
$\text{Cr}_2\text{O}_7^{2-}$	dichromate	-2
$\text{MnO}_4^-$	permanganate	-1

<b>CATIONS</b>		
<i>Formula</i>	<i>English name</i>	<i>Charge</i>
$\text{Li}^+$	lithium	+1
$\text{Na}^+$	sodium	+1
$\text{K}^+$	potassium	+1
$\text{Ca}^{2+}$	calcium	+2
$\text{Mg}^{2+}$	magnesium	+2
$\text{Ba}^{2+}$	barium	+2
$\text{Al}^{3+}$	aluminium	+3
$\text{Pb}^{2+}$	lead(II)	+2
$\text{Pb}^{4+}$	lead(IV)	+4
$\text{Bi}^{3+}$	bismuth	+3
$\text{Ag}^+$	silver	+1
$\text{Cr}^{3+}$	chromium(III)	+3
$\text{Co}^{2+}$	cobalt(II)	+2
$\text{Ni}^{2+}$	nickel(II)	+2
$\text{Zn}^{2+}$	zinc	+2
$\text{Mn}^{2+}$	manganese(II)	+2
$\text{Cu}^+$	copper(I), cuprous	+1
$\text{Cu}^{2+}$	copper(II), cupric	+2
$\text{Fe}^{2+}$	iron(II), ferrous	+2
$\text{Fe}^{3+}$	iron(III), ferric	+3
$\text{Hg}_2^{2+}$	mercury(I), mercurous	+2
$\text{Hg}^{2+}$	mercury(II), mercuric	+2
$\text{NH}_4^+$	ammonium	+1

The salts or hydroxides can be hydrated, e.g.  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ,  $\text{Ba(OH)}_2 \cdot 8\text{H}_2\text{O}$ .

From basic (oxide/hydroxide) salts, only the **basic bismuth nitrate**, formula **BiNO<sub>3</sub>(OH)<sub>2</sub>**, or **BiNO<sub>3</sub>(O)**, is of significance for us.

### 7. Coordination compounds:

<i>Formula</i>	<i>English name</i>
K <sub>4</sub> [Fe(CN) <sub>6</sub> ]	potassium hexacyanoferrate(II), potassium ferrocyanide
K <sub>3</sub> [Fe(CN) <sub>6</sub> ]	potassium hexacyanoferrate(III), potassium ferricyanide
Na <sub>2</sub> [Fe(CN) <sub>5</sub> NO]	sodium pentacyanonitrosylferrate(III), sodium nitroprusside
[Ag(NH <sub>3</sub> ) <sub>2</sub> ] <sup>+</sup>	diamminesilver cation
[Cu(NH <sub>3</sub> ) <sub>4</sub> ] <sup>2+</sup>	tetraamminecopper(II) cation