A

Toxin: Phosgene, $COCl_2$

Use:
Biological weapon in World War I

Effect on body:
Damages eyes, nose, throat, and lungs

Chemical equation (in body):
$COCl_2(g) + H_2O(l) \longrightarrow 2HCl(aq) + CO_2(g)$

Interpretation:
Phosgene gas reacts with water from tears, saliva, or mucus to produce aqueous hydrochloric acid and carbon dioxide gas.

B

Toxin: Formaldehyde, CH_2O

Use:
In the production of plywood and carpeting

Effect on body:
Blood acidosis leading to coma

Chemical equation (in body):
$2CH_2O(aq) + O_2(g) \longrightarrow 2CH_2O_2(aq)$

Interpretation:
Aqueous formaldehyde reacts with oxygen gas to produce aqueous formic acid in the blood.

C

Toxin: Thallium oxide, Tl_2O

Use:
In the creation of clay pottery and ceramics

Effect on body:
Nerve damage

Chemical equation (in body):
$Tl_2O(s) + 2HCl(aq) \longrightarrow 2TlCl(aq) + H_2O(l)$

Interpretation:
Solid thallium (I) oxide reacts with aqueous hydrochloric acid (stomach acid) to form aqueous thallium (I) chloride and water.

D

Toxin: Ammonia, NH_3

Use:
Often found in household cleaning supplies

Effect on body:
Damages eyes, nose, throat, lungs

Chemical equation (in body):
$NH_3(g) + H_2O(l) \longrightarrow NH_4OH(aq)$

Interpretation:
Ammonia gas reacts with water (tears, saliva, mucus) to produce aqueous ammonium hydroxide.

E ***Toxin: Nitric oxide, NO***

Use:
Produced by automobile engines and lightning

Effect on body:
Damages eyes, nose, throat, lungs

Chemical equation (in body):
$4NO(g) + O_2(g) + 2H_2O(l) \longrightarrow 4HNO_2(aq)$

Interpretation:
Nitric oxide gas reacts with water (tears, saliva, mucus) and oxygen gas to produce aqueous nitrous acid.

F ***Toxin: Ethanol, C_2H_6O***

Use:
As automobile fuel; found in alcoholic beverages

Effect on body:
Blood acidosis leading to coma

Chemical equation (in body):
$C_2H_6O(aq) + O_2(g) \longrightarrow C_2H_4O_2(aq) + H_2O(l)$

Interpretation:
Aqueous ethanol reacts with oxygen gas to produce aqueous acetic acid and water in the blood.

G ***Toxin: Chlorine, Cl_2***

Use:
In water purification, disinfectants, and bleach

Effect on body:
Damages eyes, nose, throat, and lungs

Chemical equation (in body):
$Cl_2(g) + H_2O(l) \longrightarrow HOCl(aq) + HCl(aq)$

Interpretation:
Chlorine gas reacts with water (tears, saliva, mucus) to produce aqueous hypochlorous acid and aqueous hydrochloric acid.

H ***Toxin: Mercury sulfide, HgS***

Use:
As a red paint pigment

Effect on body:
Nerve damage

Chemical equation (in body):
$HgS(s) + 2HCl(aq) \longrightarrow HgCl_2(s) + H_2S(aq)$

Interpretation:
Solid mercury (II) sulfide reacts with aqueous hydrochloric acid (stomach acid) to produce solid mercury (II) chloride and aqueous hydrogen sulfide.

I

Toxin: Ethylene glycol, $C_2H_6O_2$

Use:
As antifreeze in automobiles

Effect on body:
Blood acidosis leading to coma

Chemical equation (in body):
$$C_2H_6O_2(aq) + O_2(g) \longrightarrow C_2H_4O_3(aq) + H_2O(l)$$

Interpretation:
Aqueous ethylene glycol reacts with oxygen gas to produce aqueous glycolic acid and water in the blood.

J

Toxin: Lead carbonate, $PbCO_3$

Use:
In house paint until 1978

Effect on body:
Nerve damage

Chemical equation (in body):
$$PbCO_3(s) + 2HCl(aq) \longrightarrow PbCl_2(aq) + H_2CO_3(aq)$$

Interpretation:
Solid lead (II) carbonate reacts with aqueous hydrochloric acid (stomach acid) to produce aqueous lead (II) chloride and carbonic acid.

K

Toxin: Sodium oxalate, $Na_2C_2O_4$

Use:
In certain foods: chocolate, peanuts, spinach, beets, rhubarb, berries

Effect on body:
Kidney stones

Chemical equation (in body):
$$Na_2C_2O_4(aq) + CaCl_2(aq) \longrightarrow CaC_2O_4(s) + 2NaCl(aq)$$

Interpretation:
Aqueous sodium oxalate reacts with aqueous calcium chloride to produce solid calcium oxalate and aqueous sodium chloride.

L

Toxin: Lead, Pb

Use:
Formerly in household paint, toys, plumbing, and car bodies

Effect on body:
Nerve damage

Chemical equation (in body):
$$Pb(s) + 2HCl(aq) \longrightarrow PbCl_2(aq) + H_2(g)$$

Interpretation:
Solid lead reacts with aqueous hydrochloric acid (stomach acid) to produce aqueous lead (II) chloride and hydrogen gas.

M

Toxin:
Arsenic, As

Use:
In agricultural insecticides; found in contaminated groundwater

Effect on body:
Nerve damage

Chemical equation (in body):
$2As(s) + 6HCl(aq) \longrightarrow 2AsCl_3(aq) + 3H_2(g)$

Interpretation:
Solid arsenic reacts with aqueous hydrochloric acid (stomach acid) to produce aqueous arsenic trichloride and hydrogen gas.

N

Toxin:
Oxalic acid, $C_2H_2O_4$

Use:
Natural ingredient of many plants and foods, including black pepper, parsley, and rhubarb

Effect on body:
Kidney stones

Chemical equation (in body):
$C_2H_2O_4(aq) + CaCl_2(aq) \longrightarrow CaC_2O_4(s) + 2HCl(aq)$

Interpretation:
Aqueous oxalic acid reacts with aqueous calcium chloride to produce solid calcium oxalate and aqueous hydrochloric acid.

O

Toxin:
Methanol, CH_4O

Use:
As a fuel in dragsters, sprint cars, and model airplanes

Effect on body:
Blood acidosis leading to coma

Chemical equation (in body):
$CH_4O(aq) + O_2(g) \longrightarrow CH_2O_2(aq) + H_2O(l)$

Interpretation:
Aqueous methanol reacts with oxygen to produce aqueous formic acid and water in the blood.

P

Toxin:
Sodium phosphate, Na_3PO_4

Use:
As a cleaning agent, degreaser, and laxative

Effect on body:
Kidney stones

Chemical equation (in body):
$2Na_3PO_4(aq) + 3CaCl_2(aq) \longrightarrow Ca_3(PO_4)_2(s) + 6NaCl(aq)$

Interpretation:
Aqueous sodium phosphate reacts with aqueous calcium chloride to produce solid calcium phosphate and aqueous sodium chloride.