

TOXIC REACTIONS CARDS

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):

$$\text{COCl}_2(g) + \text{H}_2\text{O}(l) \longrightarrow 2\text{HCl}(aq) + \text{CO}_2(g)$$

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):

$$2\text{CH}_2\text{O}(aq) + \text{O}_2(g) \longrightarrow 2\text{CH}_2\text{O}_2(aq)$$

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):

$$\text{Tl}_2\text{O}(s) + 2\text{HCl}(aq) \longrightarrow 2\text{TlCl}(aq) + \text{H}_2\text{O}(l)$$

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):

$$\text{NH}_3(g) + \text{H}_2\text{O}(l) \longrightarrow \text{NH}_4\text{OH}(aq)$$

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

E **Toxin:**
Nitric oxide, NO

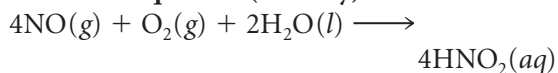
Use:

Produced by automobile engines and lightning

Effect on body:

Damages eyes, nose, throat, lungs

Chemical equation (in body):



Interpretation:

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

F **Toxin:**
Ethanol, C₂H₆O

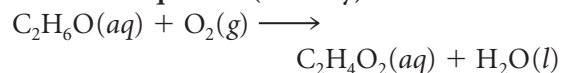
Use:

As automobile fuel; found in alcoholic beverages

Effect on body:

Blood acidosis leading to coma

Chemical equation (in body):



Interpretation:

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

G **Toxin:**
Chlorine, Cl₂

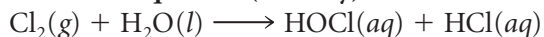
Use:

In water purification, disinfectants, and bleach

Effect on body:

Damages eyes, nose, throat, and lungs

Chemical equation (in body):



Interpretation:

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

H **Toxin:**
Mercury sulfide, HgS

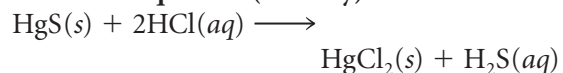
Use:

As a red paint pigment

Effect on body:

Nerve damage

Chemical equation (in body):



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, $C_2H_6O_2$

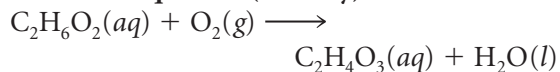
Use:

As antifreeze in automobiles

Effect on body:

Blood acidosis leading to coma

Chemical equation (in body):



Interpretation:

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

J **Toxin:**
Lead carbonate, $PbCO_3$

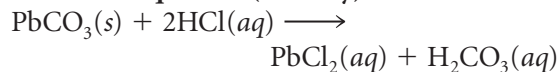
Use:

In house paint until 1978

Effect on body:

Nerve damage

Chemical equation (in body):



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, $Na_2C_2O_4$

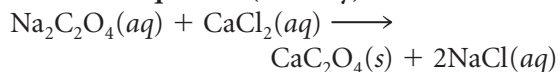
Use:

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

Effect on body:

Kidney stones

Chemical equation (in body):



Interpretation:

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

L **Toxin:**
Lead, Pb

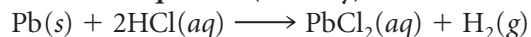
Use:

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

Effect on body:

Nerve damage

Chemical equation (in body):



Interpretation:

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

M **Toxin:**
Arsenic, As

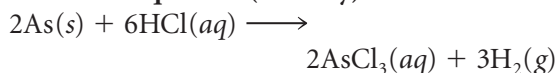
Use:

In agricultural insecticides; found in contaminated groundwater

Effect on body:

Nerve damage

Chemical equation (in body):



Interpretation:

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

N **Toxin:**
Oxalic acid, C₂H₂O₄

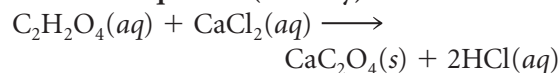
Use:

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

Effect on body:

Kidney stones

Chemical equation (in body):



Interpretation:

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

O **Toxin:**
Methanol, CH₄O

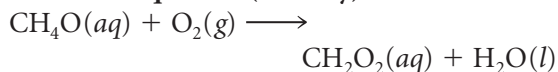
Use:

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

Effect on body:

Blood acidosis leading to coma

Chemical equation (in body):



Interpretation:

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

P **Toxin:**
Sodium phosphate, Na₃PO₄

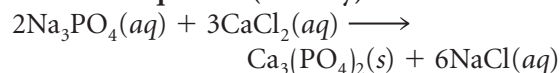
Use:

As a cleaning agent, degreaser, and laxative

Effect on body:

Kidney stones

Chemical equation (in body):



Interpretation:

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