

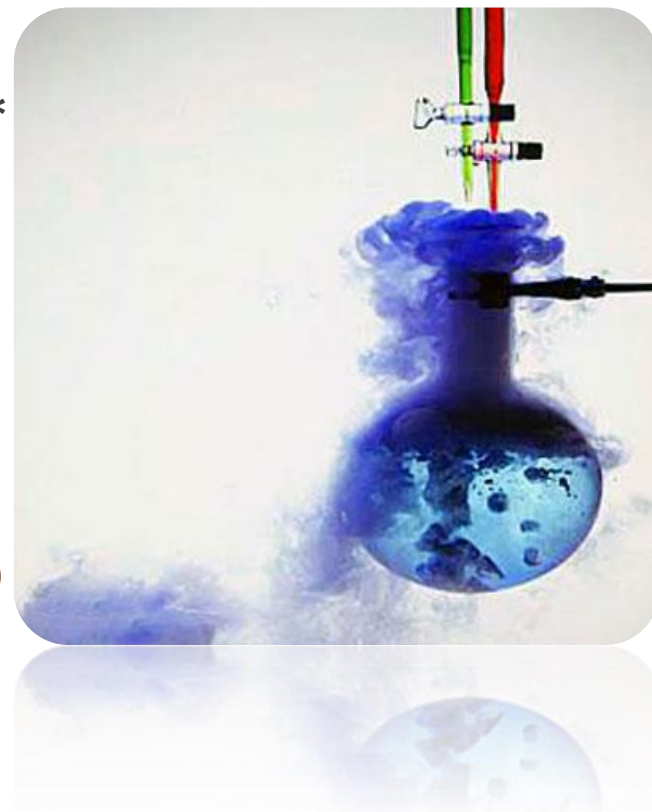
4.3 Chemical Properties

SNC1D

Chemical Property

A **chemical property** describes the ability of a substance to _____*
with another substance

- one or more new substances is produced as a result
- only revealed in the presence (or absence) of a chemical reaction



Chemical Changes

When two substances undergo a reaction a chemical change may occur.

Five clues of chemical change:

1. colour change
2. bubbles
3. new odour
4. heat/light
5. new solid forms



Examples of Chemical Properties

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graph TD; A[Examples of Chemical Properties] --- B[Reactivity]; A --- C[Combustibility]; A --- D[Stability]; A --- E[Toxicity]
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Reactivity

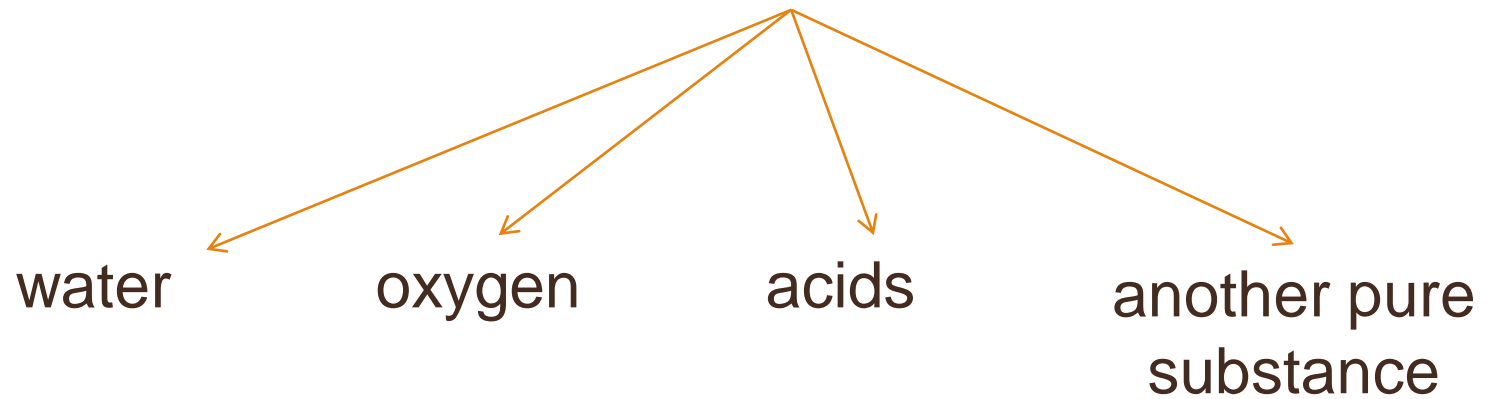
Combustibility

Stability

Toxicity

1. Reactivity

the tendency to react with **another substance**





Cloud Gate is made of stainless steel.

Why is it desirable to use such a non-reactive substance?



2. Combustibility

the ability of a substance to burn



Which of these structure is composed of a combustible material?



3. Stability

Some chemical compounds *break down* over time.

How?

- exposure to UV energy
- reaction with other substances

Stability – The ability of a substance to withstand breaking down

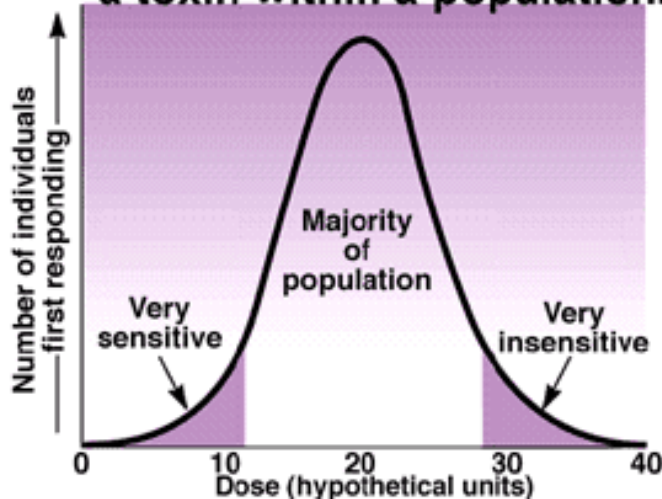
4. Toxicity

the ability of a substance to cause harmful effects

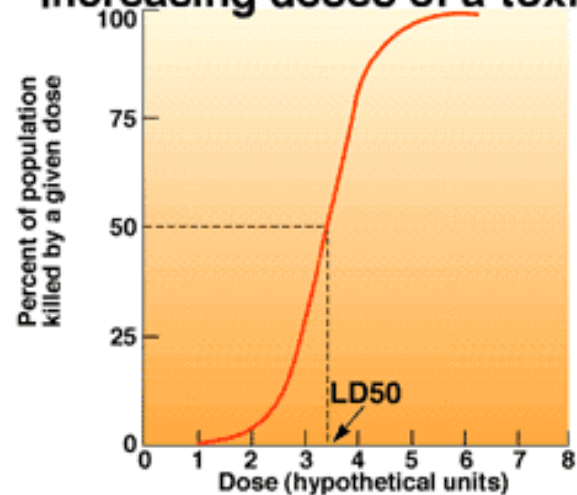
common measurement: LD₅₀ (“lethal dose, 50%”)

- the dose required to kill 50% of an exposed population

Cunningham/Seigo, Environmental Science, A Global Concern, 9th ed. © 1999 The McGraw-Hill Companies, Inc. All rights reserved.
Probable variations in sensitivity to a toxin within a population.



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Cumulative population response to increasing doses of a toxin.



Stability can enhance toxicity

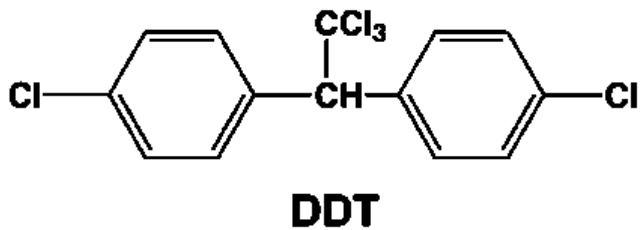
Case study: DDT

effective insecticide

extremely stable

soluble in fat

accumulates in consumers in food chains



Adverse environmental effects:

- eggshell thinning in birds
- unclear effects on humans



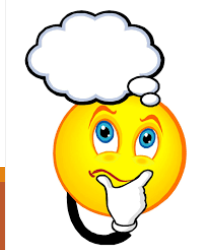
Chemical Reactions: Testing for Gases

Carbon dioxide (2 tests):

Oxygen gas:

Hydrogen gas:

Video



Homework

1. Read 4.3
2. Q # 1-3, 5, 7

