



**COSHH: Control of  
Substances Hazardous to Health**

**Module 2**

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Health & Safety  
**Essentials**

Registered charity number 207890

# Hazardous substances

## Objective:

In this component, you will learn where to find information to enable you to classify and assess chemical risk.

Some Important Sources of Information on Chemical Hazards:

- Labels on chemical containers
- Your supervisor
- Your University Health & Safety adviser/officer
- Suppliers' Safety Data Sheets (SDS)
- Reference books

Safety Data Sheets (SDS) are produced by suppliers. They provide information on chemical products that help users of those chemicals to assess risk. They describe the hazards of the substance or preparation (mixture) and give information on handling, storage and emergency measures in case of an accident. An SDS is not a risk assessment!

## How are hazardous substances identified?

***"All substances are poisonous; there is none which is not a poison. The right dose differentiates a poison and a remedy" – Paracelsus, 1525***

A substance hazardous to health is a substance or preparation (mixture) with the potential to cause harm if inhaled, ingested, touched or absorbed through the skin. Such a substance is identified as "dangerous for supply", and is classified as either very toxic, toxic, harmful, corrosive or an irritant.

This includes:

- substances identified as dangerous for supply and classified as very toxic, toxic (including sensitisers and carcinogens), harmful, corrosive or an irritant
- any substance that has an approved Workplace Exposure Limit (WEL)
- any biological agent used at work (e.g., microorganisms)
- any dust (e.g., wood dust). This is defined in terms of total airborne or respirable dust (i.e.,  $>10\text{mg}/\text{m}^3$  TWA 8hr or  $>4\text{mg}/\text{m}^3$  TWA 8hr).
- any other substance that creates a risk to health because of its properties and the way it is used or is present in the workplace



## Substances of known toxicity

Substances hazardous to health as defined by the COSHH Regulations derive their hazard classifications from either the Chemicals (Hazard Information and Packaging for Supply) Regulations (CHIP) 2002 or the European Regulations (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures Regulations (CLP). From now until June 1st, 2015, there is a transition period from the requirements of CHIP to those of CLP; both classification systems will remain in operation until 2015, after which only CLP will apply. Both classification systems provide pictorial and descriptive information about hazards together with information on protecting yourself from the hazards so described. The two systems have different requirements for substances and preparations.

**Note that under the new Classification Labelling and Packaging regulation (CLP), Hazard statements (H) replace the Risk (R) phrases of CHIP, and Precautionary statements (P) replace the Safety phrases (S) on labels and safety data sheets.**

Since 2009, the new international symbols have been gradually replacing the European symbols.

CHIP hazard pictograms (orange boxes) are very similar to the new CLP hazard symbols (red end-on squares, see below), but there is no word or phrase describing the hazard.



'Toxic' or 'Very Toxic'



'Irritant' or 'Harmful'



'Corrosive'



'Acute Toxicity'  
Severe



'Irritant' or 'Toxic or  
'STOT' (Less Severe)



'Corrosive'



'CMR' or 'STOT' or  
'Aspiration Hazard'

**CMR** = carcinogenic, germ cell mutagenic, toxic to reproduction;

**STOT** = specific target organ toxicity

**HSE COSHH Essentials assigns most substances to one of six toxic hazard categories:**

**A = low (e.g., R36 Irritating to eyes)**

**B = moderate (e.g., R20 Harmful by inhalation)**

**C = significant (e.g., R23 Toxic by inhalation)**

**D = high (e.g., R26 Very toxic by inhalation)**

**E = special, including substances of extreme hazard (e.g., R45 May cause cancer)**

**S = substances causing harm in contact with skin and eyes (often substances penetrate the skin, so there is almost always a skin risk)**

For substances and mixtures that do not have CHIP Risk Phrases, other sources of information should be used to determine suitable hazard categories. These include:

- in-house and third party experience and data
- advice from suppliers
- technical and scientific literature (books, journals, etc.)
- guidance from the UK Health & Safety Executive (HSE) and other authoritative bodies such as learned societies, professional institutions and trade associations
- specialist occupational health consultants

## Substances of unknown toxicity

**Novel and uncategorised substances of unknown toxicity require careful consideration. They should be treated as “high” hazards.**

Note that Hazardous Substances that have properties that classify them as flammable, oxidizing and explosive are also covered by other regulations such as The Dangerous Substances and Explosive Atmospheres Regulations (DSEAR2002) and explosives legislation in the UK.

Checklist for Identifying Chemical Hazards

- Does any chemical/mixture you use have a danger/warning label?  
Is the substance harmful to breathe in?  
Can the substance harm your skin?
- Does your work produce gas, fumes, dust, mist or vapour?
- Is it likely that harm could arise because of the way in which chemicals will be used?

## Learning assessment 1

| Are the statements below true or false? |  | true | false |
|---|--|------|-------|
| 1.                                      | COSHH assessments need to be carried out for all hazardous substances (chemicals) stored in the laboratory.                                |      |       |
| 2.                                      | COSHH assessments include potential damage to property.  |      |       |
| 3.                                      | Substances that are classified as flammable must be included in COSHH assessments.   |      |       |
| 4.                                      | Risk is a product of hazard likelihood, and the extent and consequences of exposure.   |      |       |
| 5.                                      | COSHH only applies to hazardous substances, out of or in connection with work-related activities within a workplace, such as a laboratory. |      |       |
| 6.                                      | I have just prepared a reagent containing Dichloromethane: Water 80:20. My label only needs to say the chemical names.                     |      |       |
| 7.                                      | The SDS is all I need to compile the COSHH assessment.   |      |       |

Check your answers on the separate answer sheet.

