



University : University of Babylon  
Country : Iraq  
Web Address : <http://www.uobabylon.edu.iq/>

## Toxic Waste Handled





Under Patronage The Minister of Higher Education & Scientific Research  
University of Babylon held

**The 5th Virtual International CBRN Safety and Security Conference**  
12-14 December, 2020

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**UNIVERSITY OF BABYLON**

**About**

The University of Babylon is founded in 2514/1991 and it is situated in the south of Baghdad the capital of Iraq. Now, the university has 19 colleges and a number of scientific and consultancy units. The number of students attended the university is 23 thousands students for both evening and morning studies.

**Statistics**

- Number of teachers: 1700
- Campaign Ph.D.: 1180
- Faculty Members: 224
- Number of students: 25462
- Number of employees: 2869
- Number of graduates: 5306

**UNIVERSITY OF BABYLON** جامعة بابل | العراق  
شعبة السيطرة على تداول المواد الكيميائية والبيولوجية الخطرة والسامة

English Version | موقع المؤتمر | التواصم هنا | الرواية المتكاملة | خدمة اللغة العراقية | خدمة اللغة العربية والسامية

شعبة السلامة والأمن الكيميائي والبيولوجي والاصطناعي  
عدد رسائل الترسية: 4227

**القسم الإنجليزي**  
الرئيس: د. عبد الرزاق  
نائب الرئيس: د. هادي  
مدير القسم: د. هادي  
معاون مدير القسم: د. هادي  
مساعد مدير القسم: د. هادي  
مساعد مدير القسم: د. هادي

**القسم العربي**  
رئيس القسم: د. هادي  
نائب الرئيس: د. هادي  
مدير القسم: د. هادي  
معاون مدير القسم: د. هادي  
مساعد مدير القسم: د. هادي  
مساعد مدير القسم: د. هادي

**C.B.R.N.S.S.D**  
Chemical, Biological, Radiological, and Nuclear Safety & Security Department  
شعبة السلامة والأمن الكيميائي والبيولوجي والاصطناعي والسام

Toxic Waste Treatment (University of Babylon, Iraq)

### Toxic Waste Handling:

Management of hazardous waste, including solid, liquid and gaseous hazardous waste is directed by C.B.R.N.S.S.D (Chemical, Biological, Eadiological, and Nucler Safty & Security Department) (<http://cbrssd.uobabylon.edu.iq/> ,

<http://cbrnssd.uobabylon.edu.iq/uob.html> , <http://en.cbr.conference.uobabylon.edu.iq/> )

in several units spread out in all the faculties of the University of Babylon. Every laboratory is equipped with a temporary storage of the hazardous waste to safely store the hazardous waste by trained technicians until they are picked up and discharged in according with the national and international regulations.



The Chancellery of the University of Babylon

# University Policies for Sustainable Development Goals

Prepared by

**The Standing Committee  
for Policy Preparation and Review**

## Committee Members

- Member 1: Prof. Dr. Abbas Nouri Khudhair  
Member 2: Prof. Dr. Ismael Sa'saa'  
Member 3: Prof. Dr. Falih Hassan Kati'  
Member 4: Prof. Dr. Ayad Mohammed Jabur  
Member 5: Prof. Dr. Zeinab Abdul Razzaq Abboud  
Member 6: Asst. Prof. Dr. Hilal Abdul-Hussein Abboud al-Libawi  
Member 7: Lect. Dr. Bushra Mohammed Kadhim al-Mutairi  
Member 8: Miss Haneen Ali Haleem, Translator

**Committee Chairman:** Prof. Dr. Kahtan Hadi Hussein al-Jeburi

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September 2021

<http://www.uobabylon.edu.iq/>  
<http://sustainability.uobabylon.edu.iq/>

<b>Policy Number</b>	UoBPP-19
<b>Effective Date</b>	Add a future date when the policy will come into effect in the following format: mm/dd/yy.
<b>Validation Date</b>	30/10/2021
<b>Revised Date</b>	Not available

<b>Purpose of Policy</b>	The purpose of this policy is to landfill hazardous materials and dispose of waste. They are harmful to the health of students, affiliates, and any living organisms due to their high toxicity and the inability to be decomposed, thereby causing diseases in the long term.
<b>Additional Authority</b>	<ul style="list-style-type: none"> <li>• The United Nations Program for Ensuring Sustainability and Environmental Protection for the year 1972.</li> <li>• Law of the Iraqi Ministry of Environment No. (37) of 2008.</li> <li>• Iraqi Law for the Protection and Improvement of the Environment No. (27) of 2009</li> </ul>
<b>Scope of Executors</b>	<ul style="list-style-type: none"> <li>• Division of Radiation and Hazardous Chemicals</li> <li>• Environmental Research Center</li> <li>• All students and affiliates</li> </ul>
<b>Approval Authority</b>	The University Chancellor
<b>Responsible Authority</b>	<p>The relevant bodies which are responsible for the implementation and management include:</p> <ul style="list-style-type: none"> <li>• the Vice-Chancellor for Administrative and Financial Affairs;</li> <li>• the Vice-Chancellor for Scientific Affairs;</li> <li>• Heads of scientific departments;</li> <li>• all academic faculty members;</li> <li>• all administrative departments at the chancellery and colleges.</li> </ul>
<b>Recipients</b>	<p>After ratification and circulation, the following main departments and offices are to be notified:</p> <ul style="list-style-type: none"> <li>• Ministry of Higher Education and Scientific Research and its departments;</li> <li>• Ministry of Health;</li> <li>• Ministry of Environment;</li> <li>• Babylon Governorate Office;</li> <li>• Directorate of Environment, Babylon Governorate;</li> <li>• the University Chancellor;</li> <li>• the University Vice-Chancellor for Administrative and Financial Affairs;</li> <li>• the University Vice-Chancellor for Scientific Affairs;</li> <li>• Deans and associate deans at the university faculties;</li> <li>• all University centers and departments</li> <li>• Studies and Planning Department.</li> <li>• Quality Assurance Department.</li> <li>• Mail Service Department</li> </ul>
<b>Policy Publication Sites</b>	<ul style="list-style-type: none"> <li>• SDG Guide to Public Policies and Administrative Procedures at the University of Babylon;</li> <li>• The official Arabic website for the University of Babylon and its colleges;</li> <li>• The official English website for the University of Babylon and its colleges;</li> <li>• An official notice to all the university's faculties and chancellery departments.</li> </ul>
<b>Definitions and Terms</b>	<i>Hazardous materials:</i> These can be solid, liquid or gaseous substances that may harm human beings or other living organisms, properties, or the environment. (Source: Wikipedia)

	<p><i>Waste:</i> It is the eventual remainder of domestic, agricultural, and industrial human activities. It is the substance which is discarded after use, and the neglect of which threatens and harms public health and safety.</p> <p><i>Pollution:</i> It refers to the presence of pollutants in the environment whose quantity, concentration or natural characteristic may directly or indirectly cause harm to humans or living organisms.</p> <p><i>Environmental protection:</i> It refers to the process of preserving and upgrading the components of the environment and preventing its deterioration or pollution through reducing the severity of pollution.</p> <p><i>Improving the environment:</i> It is a set of measures and measures taken for eliminating or mitigating negative environmental impacts to locally acceptable levels, in accordance with national legislation and approved international standards.</p>
<b>Policy Title</b>	<b>Policy for Hazardous material landfilling and waste disposal</b>
<b>Policy Statement</b>	<p>In accordance with the commitment of the University of Babylon to respect and protect human rights in terms of health and the environment, the university continues to realize the following goals:</p> <ul style="list-style-type: none"> <li>• Commitment to scientific and practical methods of disposing waste and hazardous materials so as to ensure that none of these wastes reach any environmental components such as the soil, surface and ground water, or the air. This applies to all wastes regardless whether they are found within the internal or external environment of the university campus.</li> </ul> <p>Among the most important ways of disposing waste and hazardous materials to be followed are:</p> <ul style="list-style-type: none"> <li>• Incineration: The use of incinerators to dispose of medical and other wastes so as to ensure the elimination of any type of viruses that might exist in them.</li> <li>• Burial: Burying radioactive waste in secure containers or capsules to make sure that it does not leaking into the surface or underground.</li> <li>• Repackaging and burying radioactive materials while ensuring their isolation, to prevent any form of interaction.</li> <li>• Committing to the university's regulations and instructions related to the use of radioactive materials in the laboratories of the physics, chemistry and biology departments and all research centers.</li> </ul>
<b>Administrative Procedure(s)</b>	<ul style="list-style-type: none"> <li>• Activating the supervisory role by applying the controls and instructions of landfilling hazardous materials and waste disposal in order to ensure the safety of health for both the educational and administrative environments, in accordance with the university's commitment to environmental protection laws.</li> <li>• Implementing the provisions of the aforementioned laws.</li> </ul>
<b>Other Notes</b>	The committee recommends increasing the financial allocations for these purposes in light of their importance.

Name of document:

Arabic\_UoBPP\_9\_2021.docx

The revision took place during the committee meeting held on (7/10/2021).

## General instruction for getting rid of **Chemical Waste** (organic and inorganic) in the labs at UNIVERSITY OF BABYLON

The main steps that researchers or scholars must follow:

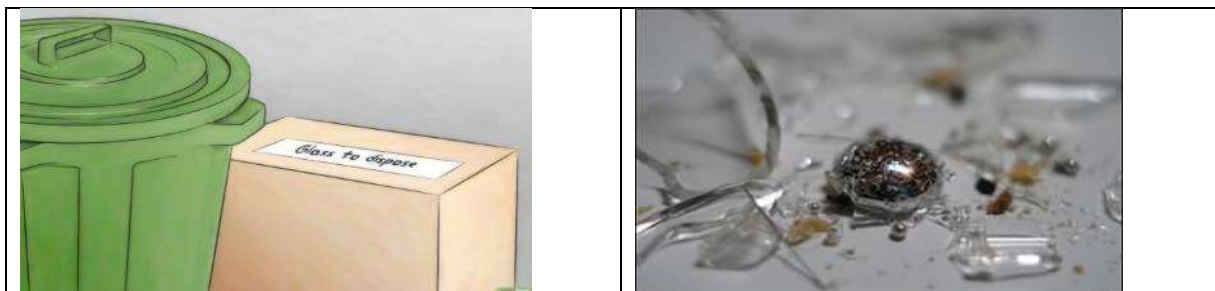
**First:** Classify the chemical materials into kinds; solid, papers, glass and liquid, and place them in the designated container. Caution must be taken in this step by reading what is written on the waste container to make sure that the waste is placed in the place designated for it.



**Second:** Make sure to cover the container immediately with its cover after placing the waste, please follow:

- Do not pour chemicals directly into the basin or into the sewage net except that the instructions and laws allow it (check this issue with your professor/ supervisor (for example, water and aqueous solutions of sodium chloride, sugar and soap can be disposed directly in the basin or through the healthy sewage net.
- Place other materials contaminated with chemicals such as napkins and towels used to wipe off residual chemical spills in a waste container designated for chemical waste, which are specially designated containers for this use. Check with your professor whether cleaning materials need to be handled as hazardous waste or put it in available daily rubbish containers.





- Put the broken glass in designated container, but if the broken glass is contaminated with chemicals, you should ask your professor where to dispose of that glass.
- If an accident occurred while you are using a mercury thermometer that causes the scale to break, inform your professor immediately. The cleaning process of dispersed mercury requires special procedures due to the toxicity of mercury, and broken thermometers may contain mercury in their fragments, and therefore the broken and contaminated glass must be disposed of with mercury in a specific container.



## What is meant by Toxic Waste

- Important procedures for scholars to follow when working with chemical waste
- The effects of chemical waste on the environment

- Flammability of chemical waste
- What is meant by chemical waste?

**Chemical Toxic Waste:** It is waste made from harmful chemicals (mostly produced by large factories, chemical interactions, and as a result of bio intervention). Chemical waste may fall under regulations such as (COSHH) or the Clean Water Act and the Resource Conservation and Recovery Law in some countries of the world. The Environmental Protection Agency and the Occupational Safety and Health Administration regulate In addition to governmental and local regulations also the use and disposal of chemicals. Chemical waste may or may not be classified as a hazardous waste, and a hazardous chemical waste is a solid, liquid or gaseous substance that exhibits either a "hazardous characteristic" or "specifically listed" by name as Dangerous Waste.

Simply chemical material is a pure substance and it can be a gas, a liquid or a solid and it may consist of either an element or of a molecule or a compound unified in nature, the chemicals can occur naturally or we can synthesize them artificially in laboratory settings

There are a set of characteristics of chemical waste that may be considered hazardous, these are (flammability, flammability, corrosion, potency, and toxicity). This type of hazardous waste must be classified according to its identity, components and hazards, so that it can be safely handled and managed. Chemical waste is a broad term that includes many types of materials.

**Important procedures for workers to follow when working with chemical waste:**

Scholars or researchers who use chemicals as part of their projects have to follow the standard protocols; to prevent exposure

and reduce the possibility of spills and accidents, personal protective equipment such as gloves and eye protection can protect workers from stains and contact hazards and smoke hoods can eliminate the risk of inhaling harmful chemicals and storage tanks can reduce the risk of fires and spills.

Another aspect of chemical safety that must be managed is the protection of the environment from chemical contamination. Inappropriate or neglectful disposal practices have major impacts on the environment including polluted water sources, poisoning wildlife and the creation of toxic sites unsuitable for habitat for animals or humans, for employees who They work with chemicals and thus produce chemical waste, the most important "green" activity is the careful and careful management of chemical waste. In order to protect the environment, federal and state governments have put in place very strict regulations governing chemical waste management and the only way to ensure these regulations are followed is to accompany them with severe penalties for non-compliance.

## Effects of chemical waste on the environment:

Many chemicals are used to improve our quality of life and most of them are harmless to the environment or human health, however some chemicals have the potential to cause harm in certain quantities and should only be used when potential risks are managed appropriately. If you live in a developed country it is likely that companies are disposing of tons of hazardous waste products literally every day, unfortunately a lot of this waste is not handled properly and can come back as it leaves a huge and devastating imprint on our ecosystems. Here are some of the environmental impacts of chemical waste:

Short-term impacts on the environment: The main short-term risk is water pollution, as the chemicals pouring into our waterways make streams, rivers, lakes and groundwater reservoirs unsafe to use for

drinking or agricultural purposes. Animals and plants suckle and die when they drink from this water. Downstream human health is affected yet the long-term consequences are truly terrifying.

Long-term impacts on the environment: long-term impacts include signs of animal mutation, cancer and other diseases in humans, litter in our waterways and green spaces, and the destruction of many natural resources, as insects such as bees die and are necessary to maintain the fertility of plant life faster than it can be restored Settle it due to human pollution.

Impact of chemical waste on waterways: Waste from homes or industries that have been illegally disposed of causes a great deal of pollution. This often happens near the water source, as people may think that the pollution and evidence will be removed leading to harmful consequences On the water source.

Improperly managed chemical wastes may pollute waterways: There are many causes for this type of industrial water pollution that have serious and negative impacts on aquatic and human life.

Through scientific procedures and experiments of tens or hundreds of scholars, toxic chemicals produced. Such waste have to be treated with collaboration with employees of the Safety and Security Division in the headquarters at the University.

Flammability of chemical waste: a hazardous waste due to its flammability can be classified as follows:

1. Liquid chemicals: The flash point of a liquid chemical is less than or equal to 140 degrees Fahrenheit, equivalent to 60 degrees Celsius, examples of which are: Alcohols (Note: for ethanol, mixtures greater than or equal to 20% are considered hazardous waste, as for other alcohols the cut-off ratio is 10%.
2. Organic solvents and mixtures containing organic solvents such as: xylene, hexane, toluene and acetone.

3. Stains and mixtures containing stains (because they depend on solvents).
4. Paints and oil coatings.
5. Solid chemicals: the chemical is capable of under standard temperature and pressure to cause fire through friction and moisture absorption or spontaneous chemical changes and burns vigorously upon ignition. Examples include: Paraformaldehyde, paraffin wax with xylene, rags saturated with a flammable liquid.
6. Compressed gas: The flammable compressed gases should also be managed as a hazardous waste. Generally this includes partially full or residual gas cylinders, examples of which are: hydrogen, acetylene, propane, butane.
7. Oxidants: the chemical is able to enhance the combustion of other substances in general by producing oxygen, examples of which are: chlorate, chlorite, nitrates, perchlorate, perchlorate, permanganates, peroxides.

## **Responsibilities of Chemical, Biological, Eadiological, and Nucler Safty & Security**

### **Department (C.B.R.N.S.S.D):**

- Regulation of the treatment, storage, and disposal of hazardous waste.
- Disposing of waste that cannot be recycled.
- Recycling material that can be recycled.
- Offering several workshop and training courses per year for the purpose of motivate employees and students to understand recycle and treatment terms.

### **The path of chemicals from the moment they enter the campus of the University of Babylon until they reach the research and educational laboratories in the laboratories of the University of Babylon:**

1. Chemical materials are purchased by a specialized committee based on the actual need for research and educational laboratories at the University of Babylon.
2. The Deanship of the College of Science and the University Security Division will be informed in the arrival time of the chemicals to the university's campus with a copy of the Safety and Security data sheet for these materials in Arabic and English.
3. The chemicals are transported to the chemical store and stored in metal scraps that are resistant to chemical corrosion. The chemical filters have a safe ventilation unit connected to carbon filters to prevent the transfer of gases and vapors into the environment.
4. All available data on chemicals are entered into a specialized electronic program. The information includes the substance's name, chemical symbol, scientific name, common names, the name of the manufacturer, the appropriate place to store it, and the potential risks of its use.
5. The minimum quantity of chemical suitable for laboratory or educational research shall be transferred after submitting a request by the laboratory official to a specialized committee headed by the head of the chemistry department.

6. Chemicals are transferred from the chemical store to the designated laboratory and stored in appropriate places.
7. After completing the chemical experiments, Chemical wastes, according to their type, are stored in glass bottles and stored in safe places in the laboratory.
8. Chemical wastes are delivered to the Environment Department in Babil Governorate for safe recycling or disposal.

## **Biological waste management program**

**Biohazard:** Any bacteria, recombinant DNA, synthetic DNA, recombinant (genetically modified) organisms, fungi, viruses, rickettsia, chlamydiae, parasites, allergens, viroids, virions, and prions that can be harmful to humans, animals, plants, or the environment.

**Biosafety Level:** The level of containment, on a scale of BSL-1 to BSL-4, under which the biohazard can be safely handled. As the biosafety level raises, the standards for laboratory practices, equipment, and facilities increase. The containment levels for animals housed in biosafety laboratories are called animal biosafety levels (ABSL).

**Biohazardous Waste:** Cultures, stocks, sharps, PPE, or any other item contaminated with a biohazard or pathological waste, including blood, body fluids, and animal or human tissues, excludes teeth and fixed tissues.

**Sharps** – needles, scalpels, pipette tips, biopsy punches, disposable surgical instruments, razor blades, capillary tubes, or any other item that could cause wounding to personnel, or punctures of soft sided disposal, storage, or container(s).

This program applies to Biosafety level 2 and lower laboratories that produce biohazardous waste, including biohazardous sharps waste.

This program ensures compliance with institutional and national mandates for the handling of biohazardous waste and biohazardous sharps.

### **Procedures - Decontamination**

All biohazardous waste must be properly decontaminated prior to disposal

#### **A. Biohazardous liquid waste**

##### **Method 1:**

- a) Add appropriate disinfectant for contact time, as specified in your laboratory specific biosafety manual
- b) Once contact time is completed, dispose of by pouring down the drain to sanitary sewer, or in accordance with disinfectant requirements

##### **Method 2:**

- a) Autoclave on liquid cycle, using the laboratory specific biosafety manual to determine appropriate temperature and time of cycle



b) Prior to autoclaving, container of biohazardous liquid must be labeled a biohazard, autoclave tape must be applied to container, and it must be placed in a secondary, autoclavable, high-walled, leak proof container to avoid overflow of biohazardous materials into autoclave.

c) After autoclaving, allow to cool, and use heat resistant gloves to remove the containers from autoclave

d) After decontamination is complete, dispose of by pouring down the drain to sanitary sewer

### **B. Biohazardous solid waste**

1. Place in leak-proof autoclavable biohazard bag that is clearly labeled with the universal biohazard symbol

2. Autoclave or incinerate, as indicated for the agent and specified in the lab specific biosafety manual

a) Prior to autoclaving, place an “x” in autoclave indicator tape over the universal biohazard symbol

b) After autoclaving, place biohazard bag into a black trash bag, and seal prior to disposal

c) Laboratory staff immediately disposes of properly bagged waste in the standard waste stream (e.g. dumpster).

### **C. Biohazardous sharps waste**

1. Place in hard-walled, puncture resistant, leak-proof, sealable container that is clearly labeled with the biohazard symbol.

Note: Sharps containers are single use containers and should not be emptied and reused.

2. Autoclave or incinerate, as indicated for the agent and specified in the lab specific biosafety manual

a) Prior to autoclaving, place an “x” in autoclave indicator tape over the universal biohazard symbol, or over the sharps label

b) After autoclaving, place biohazard container into a cardboard box, seal well with tape, and label box as “decontaminated sharps”

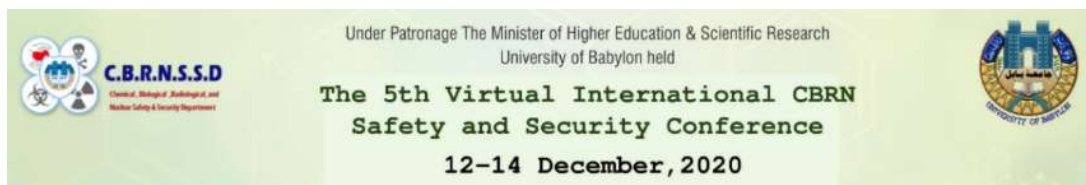
c) Laboratory staff immediately disposes of properly labeled and well-sealed box in the standard waste stream (e.g. dumpster)

For additional information:

<http://cbrssd.uobabylon.edu.iq/>



<http://cbrnssd.uobabylon.edu.iq/uob.html>



<http://en.cbr.conference.uobabylon.edu.iq/>





There are an annual sessions on how to handle and transport toxic waste to be held for departments that use toxic substances.



For more information please visit our websites <http://en.cbr.conference.uobabylon.edu.iq/>  
<http://cbrssd.uobabylon.edu.iq/>