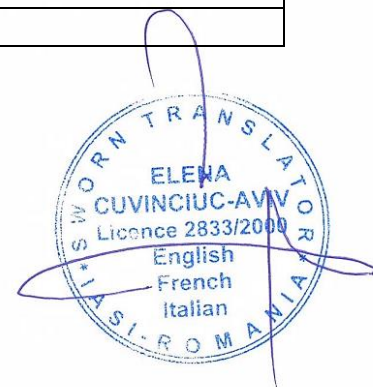

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# CHEMICAL WASTE MANAGEMENT

**CODE: PO-04**

	<b>Drafted</b>	<b>Checked</b>	<b>Approved</b>
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INDICATOR OF EDITIONS AND REVISIONS

Edition: Revision: Implementation date:	No. of reviewed section / sub-section and page	Type of change:		
		Modified	Added	Suppressed
<b>Ed.2/Rev.0/ 13.12.2019</b>	Pag.1	X		
	Sec.1/Pag.4	X		
	Sec.2/Pag.4	X		
	Sec.3/Pag.4	X	X	X
	Sec.4/Pag.4	X	X	X
	Sec.5/Pag.6/7/8	X	X	
	Sec.6/pag.8/9	X		
	Sec.7/pag.9		X	




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### 1. AIM

The purpose of this procedure is to document the activity of collection, storage, neutralization and disposal of chemical, toxic and hazardous waste.

### 2. SCOPE

The procedure applies to specific **testing laboratories** or to laboratories conducting chemical tests, to laboratories/facilities that use chemical, toxic and hazardous substances and preparations, of *'Grigore T. POPA' University of Medicine and Pharmacy of Iasi*.

### 3. REFERENCE DOCUMENTS

*SR EN ISO 9000:2015 – Quality Management Systems. Basic Principles and Definitions.*

*SR EN ISO 9001:2015 – Quality Management Systems. Requirements.*

*SR EN ISO 9004:2018 – Quality Management. Quality of an Organization. Guidelines for a Long-Lasting Success.*

*Order of the Secretary General of the Government no. 600/2018 approving the Internal Management Control Code for Public Entities*

*Law no. 211/2011 – concerning the treatment of waste*

*Romanian Government's Decision no. 349/2005 on waste storage*

**Order of the Ministry of Health no. 211/2004** approving the Procedure for regulating and controlling the transportation of waste on the Romanian territory

**Government's Decision no. 856/2002** on waste management records

### 4. DEFINITIONS AND ABBREVIATIONS

#### 4.1 Definitions

*waste = part of a raw material or a material that remains after the technological process and can no longer be used directly for the manufacture of that product*

*chemical, toxic, hazardous waste = test items, reagent products, contaminated/expired reagents, waste from practical and research work in laboratories, acids, alkali, heavy metal waste, solvent mixtures, expired chemicals, as well as waste resulting from operations that are performed in a printing facility or other workplace.*

#### 4.2 Abbreviations

PO – Operating Procedure  
 OSGG – Order of the Secretary General of the Government  
 SSM – Occupational Health and Safety



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## 5. PROCEDURE DESCRIPTION

### 5.1. Waste collection and separation on categories at the place of generation:

**Chemical waste** is collected in containers capable of preventing leakage, evaporation, corrosion and, as far as possible, unauthorized access. Containers are marked '**Toxic**' or inscribed with the associated icon.

**Reagent that are expired/ contaminated/ with uncertain qualities** are collected in cabinets marked '**Noncompliant reagents! Do not use!**'

**Contaminated materials** (disposable containers, materials used for the cleaning facilities and equipment) are collected in containers that prevent leakage, evaporation, corrosion and, as far as possible, unauthorized access. Containers are marked '**Toxic**' or inscribed with the associated icon.

The different categories of hazardous chemical waste, and hazardous chemical waste and non-hazardous chemical waste shall not be mixed.

Their collection is done separately in appropriately marked and labelled packaging, taking into account the degree of risk of each category of waste.

#### I. Organic waste:

**1. Inflammable organic solvents** (for instance: acetone, ethyl alcohol, toluene, xylene, ethyl ether, etc.)

- they will be collected separately in appropriate packaging for this type of waste/chemicals. The labels of these packages shall contain at least the danger sign:  
F - FLAMMABLE, F + - VERY FLAMMABLE

**2. Organochlorinated solvents** (for instance: methylene chloride, chloroform, etc.)

- they will be collected separately in appropriate packaging for this type of waste/chemicals. The labels of these packages shall contain at least the danger sign:  
Xn- HAZARDOUS, Xi- IRRITATING

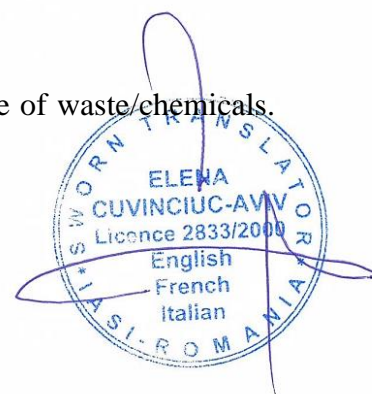
**3. Organic compounds in aqueous solution (other than those listed under 1 and 2)**

- they will be collected separately in appropriate packaging for this type of waste/chemicals. The labels of these packages shall contain at least the danger sign:  
Xn- HAZARDOUS, Xi- IRRITATING

#### II. Inorganic waste:

**1. Acid waste** (for instance: sulfuric acid, hydrochloric acid, etc.)

- they will be collected separately in appropriate packaging for this type of waste/chemicals. Concentrated acid waste will be diluted to a concentration of 5-10%. The labels of these packages shall contain at least the danger sign:  
C- CORROSIVE



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**2. Alkali waste** (for instance: sodium hydroxide, potassium hydroxide, etc.)

- they will be collected separately in appropriate packaging for this type of waste/chemicals.  
The labels of these packages shall contain at least the danger sign: C- CORROSIVE

**3. Waste of heavy metals in solution** (compounds containing lead, chromium, nickel, cadmium, etc.):

- a) Heavy metal waste (except for mercury and arsenic)
- b) Waste containing mercury
- c) Waste containing arsenic

- they will be collected separately in appropriate packaging for this type of waste/chemicals.  
The labels of these packages shall contain at least the danger sign: **T- TOXIC**

**4. Inorganic salts in solution:** they are collected in appropriate packaging after the pH has reached the 6-8 pH range.

Separate collection of waste within a category specified above is *ALWAYS done* taking into account the chemical properties of each compound that generates compatibilities or incompatibilities between different chemical agents (turned into waste). This *is* decided exclusively by the waste generator within each laboratory.

The waste generated by the chemical agents used is *collected* entirely in separate containers, avoiding their mixing and unauthorized access to them.

The containers for the collection of all types of waste must not allow the leakage or evaporation of the waste, meeting the safety criteria applying to normal handling.

## 5.2. Transportation of hazardous chemical waste within laboratories

It is carried out by the authorized personnel in that laboratory in containers capable of preventing leakage, evaporation or corrosion of the container. They are rinsed and disinfected after each use by the cleaning and/or authorized personnel within the laboratory/workplace.

## 5.3. Temporary storage

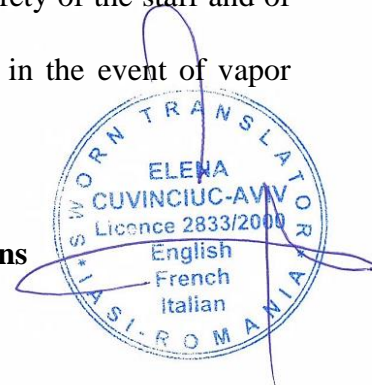
**Chemical waste** is kept in containers marked '**Toxic**' or inscribed with the associated icon, in rooms indicated by the head of the laboratory so that the access is controlled and the safety of the staff is ensured (ventilated rooms - if applicable). Temporary storage lasts until such quantities are accumulated that require disposal.

Waste from the chemical agents and preparations used, as well as expired, unidentifiable, contaminated or uncertain reagents are *stored* in marked cabinets indicated by the *teaching activity coordinator*; access to them will be controlled, *ensuring* the safety of the staff and of the students until they are disposed of.

When storing them, interaction between waste should be avoided in the event of vapor emission.

## 5.4. Recovery and neutralization of chemical waste

### 5.4.1. Recovery of mercury found in clean or residual solutions



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#### a. Reagents

- sodium hydroxide (NaOH), solution concentration: ~ 400 g/l
- hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), solution concentration: 30% (m/m)
- sodium sulphide nonahydrate (Na<sub>2</sub>S<sub>9</sub>H<sub>2</sub>O)

#### b. Work method

Residual mercury-containing solutions which cannot be disposed of in the sewage system are collected in 50 l polyethylene containers. When the collected volume is about 40 litres, while stirring by air bubbling, add sufficient sodium hydroxide solution for neutralization and then add some 400 ml more. Then add 100 g of sodium sulphide and 10 minutes later slowly add 400 ml of hydrogen peroxide.

Allow the mixture to rest for 24 hours then suck the clear liquid and discard.

The residue obtained shall be stored and/or disposed of according to the national regulations in force.

#### 5.4.2. Recovery of organic solvents

**Flammable organic solvents** - aqueous solutions containing these solvents will be subjected to distillation for recovery and reuse of the solvents in question.

**Organochlorinated solvents** - aqueous solutions containing these solvents will be subjected to distillation for recovery and reuse of the solvents in question.

#### 5.4.3 Neutralization and disposal of inorganic waste

**Acid waste** - aqueous solutions containing acids will be treated with diluted alkali solutions (which pose no risk to the environment) to neutrality, will be diluted to maximum dilution and disposed of.

**Alkali waste** - aqueous solutions containing alkali will be treated with diluted acid solutions (which pose no risk to the environment) to neutrality, will be diluted to maximum dilution and disposed of.

**Inorganic salt in solution** - aqueous solutions containing inorganic salts are diluted to maximum dilution and disposed of.

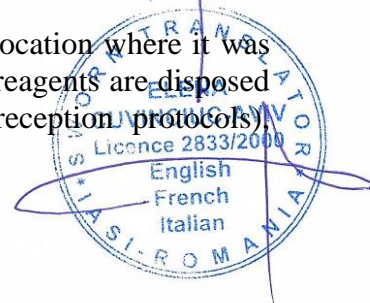
#### 5.5. Final disposal of chemical waste

It is performed whenever necessary using in this sense either the original packaging or the containers in which it was collected and stored temporarily.

Waste disposal is done by authorized providers of specialized services.

When it receives the waste, *the authorized service provider in charge of waste disposal* shall record the nature, date and quantity of waste *received* in specific records (delivery-reception reports, etc.).

Waste that cannot be recovered, neutralized and disposed of at the location where it was generated, as well as expired, unidentifiable, contaminated or uncertain reagents are disposed of through companies authorized to take over (based on delivery-reception protocols).





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transport and destroy chemical, toxic and hazardous wastes, which 'GRIGORE T. POPA' University of Medicine and Pharmacy of Iasi resorts to when needed.

### 5.6. Waste management records

Before the first day of every month, the *authorised personnel* of the work place *draws up* the waste management records for the previous month, which will be signed by the teaching activity coordinator and will be handed to the *SSM manager*.

### 5.7. Analysis of the quality of the waste water

**The quality of the waste water** is determined every three months by the 'Environment and Food Chemistry' laboratory of the Faculty of Pharmacy of 'Grigore T. Popa' University of Medicine and Pharmacy of Iași.

The findings of the physical-chemical tests conducted on waste water are recorded in the test reports, which are completed and signed by the 'Environment and Food Chemistry' manager.

## 6. DUTIES

### 6.1. Teaching activity coordinator

Makes sure the waste disposal schedule and procedure are complied with.

Monitors and is responsible for the observance of toxic and hazardous waste collection procedure and for preventing its disposal in the sewerage system.

Makes sure that the toxic and hazardous chemicals taken from the chemical storage room is accompanied by safety data sheets containing necessary information about those agents, as well as the required environmental protection and occupational health and safety measures.

*Undertakes responsibility for waste management by signing the records.*

The 'Environment and Food Chemistry' teaching activity coordinator makes sure waste water is tested.

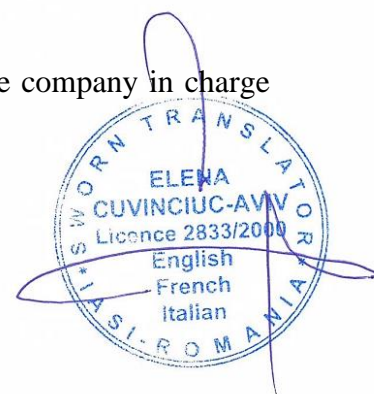
### 6.2. Personnel appointed by the teaching activity coordinator

Separately collect waste in special containers, according to this procedure.

Take the waste to temporary storage rooms.

*Draw up waste management records for the previous month.*

Hands over existing waste (with delivery-reception protocols) to the company in charge of its authorized transportation and disposal.





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### 6.3. SSM manager

Makes sure the waste water quality is tested every three months by the Environmental and Food Chemistry laboratory and keeps the test reports issued and handed by this laboratory.

*Centralises the waste management records received from the disciplines, and at the beginning of the following year sends the centralised data to the Environmental Protection Agency of Iași.*

## 7. APPENDICES AND RECORDS

No.	Name of record	Code	Drafted by:	Approved by:	No. of copies:	Disseminated:	Kept for (years)	Kept by	Archiving (years)
1.	Waste management records	FO03-01	Teaching activity coordinator	-	1	SSM manager	5 years	SSM office	-
2.	Waste delivery-reception PV concluded with the company	-	Company providing waste disposal services	-	2	1 copy – company 1 copy – discipline handing over the waste	1 year	Discipline handing over the waste	-
3.	Waste water test report	-	Teaching activity coordinator	-	1	SSM manager	3 years	SSM office	-

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