

## The introduction of a unified national approach to classification procedure of wastes to hazardous

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### Abstract

The research results of the main sources of law of the European Union and Ukraine in the field of waste were presented in the article. The comparative analysis of wastes classification procedure to hazardous in the European legislation and in the existing environmental legislation of Ukraine was carried out. A unified national approach to the classification procedure of each particular type of wastes to hazardous harmonized with the requirements of European legislation for wastes was presented.

Key words: IMPLEMENTATION, LEGISLATION, UKRAINE, THE EUROPEAN UNION, METODOLOGY, HAZARDOUS WASTES

### Introduction

One of priority directions in the environmental field has been and remains a waste management issues. The problem of reducing the negative impact of wastes on the environment is becoming increasingly important with the growth of scientific and technological progress and the rate of consumption.

There is a developed system of legal regulation of wastes management in Ukraine. But the Ukrainian legislation in the sphere of wastes is significantly different from the corresponding international and European legislation on a fundamental approach to wastes management, as well as on identification, classification and allocation of wastes to hazardous [1].

On September 16, 2014 Ukraine ratified the "Agreement on Association between Ukraine on one hand, and the European Union, the European Atomic Energy Community and their Member States on the other hand." According to Article 290 of Chapter 13 of the Agreement the Parties guarantee that their legislation will provide high levels of environmental and labor protection and will make efforts for further improvement of this legislation [2]. Ukraine Association with the European Union is impossible without the implementation of EU legislation, so the Cabinet of Ministers of Ukraine by its order dated 15 April 2015 No 371 adopted the developed by Ministry of Ecology and Natural Resources of Ukraine plans to implement the acts of the EU legislation in the sphere of environment.

### Results of the study of European legislation for wastes

Legal regulation of wastes management is part of

the European Union (EU) environmental law. European environmental law and European sources of law in respect to wastes are in the process of constant development and improvement.

European Waste Catalogue (Decision 94/3 / EWG) is a classification system on wastes, which is subjected to periodic review and update, if necessary [3].

Since 2008 Framework Directive of the EU is the European Parliament Directive and Council 2008/98 / EU of 19 November 2008 «On waste and repealing of certain directives» [4]. The Directive sets out the basic requirements for the identification and management of waste in the EU and Member States:

1. Hazardous wastes must be labeled in accordance with international standards and European Union standards.

2. The EU Commission has the right to establish criteria for determining wastes as hazardous.

3. The classification of wastes to hazardous should be based on European Union legislation on chemical substances and chemical preparations.

4. When determining waste as hazardous the limit values (established limits) should be considered, which are operated by legislation in the case of defining chemicals to hazardous.

Since 01.01.2002 till 01.06.2015 the waste classification and the attributing waste to hazardous has been carried out according to the Commission Decision dated 3 May 2000 (2000/532 / EC) [5]. The wastes are classified as hazardous under the condition that their physical properties and/or the concentration of hazardous substances (in wt., %) is such that the wastes have one or more characteristics set out in Annex III

to Directive 91/689 / EEC.

With coming into operation of the Framework Directive 2008/98 / EC in 12.12.2008 the attributing of waste to hazardous is based on of Annex III to Directive 2008/98 / EC, which lists the properties of wastes that cause their dangerous nature [5].

In order to account the scientific achievements and technological progress in the field of chemicals, the esurrence of uniform determination mechanism of wastes to hazardous and its classification in all the Member States of the EU Commission 18 December 2014 has adopted Regulation (EU) No 1357/2014 about replacing Annex III to Directive 2008/98 / EC on wastes [6].

In this judgment assessment of hazardous wastes is based on the use of the criteria of Regulation (EC) No 1272/2008 (CLP Regulation) and takes into account the classification data of chemical substances and their preparations according to international GHS standards [7].

#### **The main differences between the European and Ukrainian legislation concerning the classification of wastes**

Ukrainian legislation on wastes is significantly different from the corresponding international and European legislation. The European legislation (in accordance with Decision 2000/532 / EC) defines the hazardous properties of waste firstly, and on their basis – assignment to the safe or to hazardous which in the List of wastes marked with (\*). Whereas according to Article 34 of the Law of Ukraine “On Wastes” all hazardous wastes according to their harmful effects on the environment and on human life and health are divided into 4 classes [8].

The classification of wastes according to the 4 hazard classes was carried out on the basis of SSanRN 2.2.7.029-99 State sanitary rules and norms “Hygienic requirements for industrial waste management and determination of their class of danger to human health.” However, based on the decision of the Decisions of the State Service of Ukraine for Regulatory Policy and Entrepreneurship Development from 15.07.2014 No 33 SSanRN 2.2.7.029-99 become invalid [9].

Ministry of Ecology of Ukraine by its order dated 16.10.2000 No 165 approved the List of hazardous properties of wastes [10]. However, the approved list does not fully correspond to the List of hazardous properties of waste used in the legislation of the European Union for the identification of wastes as hazardous. The List does not take into account the following dangerous properties: irritant; toxic to specific organ (STOT) / inhalation toxicity; acutely toxic; carcinogenic; acid; toxic for reproduction; mutagenic; sen-

sitizing.

Thus, at the present time in national law in contrast to the European there are no method of identification of hazardous properties of wastes, criteria and waste attributing mechanism to hazardous or safe.

#### **The objective of the study, statement of the problem**

In order to implement the EU directives in the field of waste management including hazardous wastes the unified approach to procedure of wastes attributing to hazardous was introduced.

To achieve this objective it was necessary to solve the following problems:

- 1) to analyze the current EU legislation on wastes;
- 2) to analyze the existing normative-legal acts of Ukraine to determine the waste degree of hazard;
- 3) to study the European techniques of wastes classification as hazardous;
- 4) to develop a unified approach to the procedure for attributing each type of waste to hazardous, which would receive the status of national and became mandatory for use in each region of Ukraine.

#### **Research Materials**

The regulations documents of the European Union, the European Directives, Ukraine legislation on waste have been used for study.

#### **The results of research**

In order to implement the directives of the European Union in the field of waste management and for the Ministry of Ecology and Natural Resources of Ukraine members of the research institution “Ukrainian Research Institute of Environmental Problems” was developed unified national approach to the attributing procedure for each specific type of wastes to hazardous, harmonized with the requirements of European legislation on waste.

The first step on referring the wastes to hazardous is establishing qualitative and quantitative composition of the wastes and determining their physical properties. The concentrations of the ingredients in the wastes are defined in weight percentage or mg of chemical that contains in the waste, per kg of the total weight of waste, when it concerns to POPs (Persistent Organic Pollutants).

Hazardous wastes properties are divided into 15 categories (HR1-HR15), which take into account the physical-chemical and biological properties of the wastes:

- HP 1 “Explosive”;
- HP 2 “Oxidizing”;
- HP 3 “Flammable”;
- HP 4 “Irritant - cause skin irritation and eye damage”;
- HP 5 “Toxic for specific organ (STOT) / Toxic

by inhalation”;

- HP 6 “Acute toxicity”;
- HP 7 “Carcinogenic”;
- HP 8 “Corrosive”;
- HP 9 “Infecting”;
- HP 10 “Toxic for reproduction”;
- HP 11 “Mutagen”;
- HP 12 “Liberate very toxic gases”;
- HP 13 “Sensitizing”;
- HP 14 “Ecotoxic”;
- HP 15 “Wastes with hazardous properties listed above, which do not appear in the initial state.”

Hazardous properties of chemical substances included in the composition of the wastes may be determined by Regulation (EC) No 1272/2008, or by tests in accordance with Regulation (EC) of 30 May 2008 No 440/2008, which establishes the test methods in accordance with the Regulation of the European Parliament and Council Regulation (EC) No 1907/2006 on the registration, evaluation, authorization and restriction of chemical substances and preparations (REACH), or other internationally recognized methods of testing based on testing against animals and humans in accordance with article 7 of Regulation (EC) No 1272/2008.

International chemical name of the chemical sub-

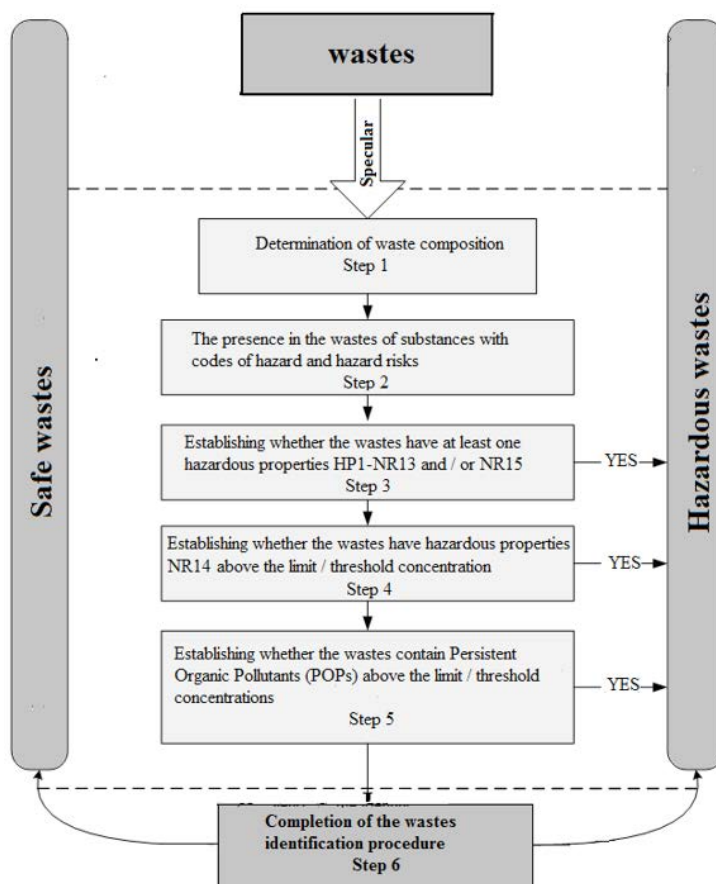
stance, EC number, CAS number, hazard class and category code, hazard code, the additional danger code are given in the tables of Annex VI «Harmonized classification and labeling for certain hazardous substances» of Regulation (EC) No 1272/2008 of 16 December 2008 on classification, labeling and packaging of substances and mixtures.

Hazardous properties HP4, NR6 and NR8 are evaluated on the basis of threshold values for individual substances. It is not included in the evaluation process if the substance is present in the wastes in a concentration below the threshold value. If hazardous wastes properties are measured according to concentration or test, the wastes must be investigated.

Wastes containing polychlorinated dibenzo-p-dioxins and dibenzofurans, and / or their concentrations exceed the limits specified in the Annex IV to Regulation (EC) of 29.04.2004 No 850/2004 on persistent organic pollutants and amending to Directive 79/117 / EEC should be identified as hazardous.

Pure metal alloys, which are not contaminated by hazardous substances are considered safe wastes. Wastes of the metal alloys, which are classified as hazardous in the List of wastes marked with (\*).

Step by step way of classifying wastes to safe or hazardous is shown in the figure 1.



**Figure 1.** Algorithm of wastes classification to safe or hazardous

Step one: the waste quality and quantity should be studied to define the chemicals concentrations that are part of the waste.

Step two: Tables 3.1 and 3.2 of Annex VI «Harmonized classification and labeling for certain hazardous substances» of Regulation (EC) No 1272/2008 establish the chemicals presence in the waste with codes of danger and risk of danger.

Step three: whether the waste has one or more hazardous properties HP1-NR13 and / or NR15 should be established. If the waste has at least one of the above mentioned hazardous properties, they are defined as hazardous. It is important to establish all the hazardous properties, which are contained in the waste. Therefore, if the wastes do not have any of the hazardous properties HP1-NR13 and / or NR15, or contain at least one or more of them further evaluation by step four is carried out.

Step Four: whether the wastes have hazardous properties of NR14 should be established. If the wastes have hazardous properties NR14 they are classified as hazardous. In the case when the wastes do not have such hazardous properties further evaluation is carried out by step five.

Step five: whether the wastes contain POPs above the limit / threshold concentrations should be established. The List of Persistent Organic Pollutants that is a subject to the provisions on waste management and their thresholds values. It is given in the Annex and IV of Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29.04.2004. If wastes contain POPs in concentrations exceeding the thresholds, the wastes are classified as hazardous.

Step Six: if it is found that the wastes have one or more hazardous properties HP1-NR15, and / or containing POPs exceeding the established thresholds, the wastes are classified as hazardous.

In the case when the wastes do not have any of the hazardous properties and do not contain POPs above set thresholds values, the wastes are considered as safe.

### Conclusion

The study showed that:

1. The principles and ways of waste classification in the European legislation and environmental legislation of Ukraine are significantly different.

2. At present, there are no criteria for classification wastes to hazardous in Ukrainian legislation. The EU legislation on waste is developed List of wastes, which identifies wastes that are classified as hazardous and safe.

3. European legislation clearly defined the principles and criteria for classification wastes as hazardous.

Hazard assessment of wastes should be based on the use of the criteria of Regulation (EC) No 1272/2008 (CLP Regulation) and take into account the classification data of chemical substances and their preparations according to the international GHS standards.

4. In accordance with European legislation, the hazardous properties of wastes are divided into 15 categories (HR1-HR15), which take into account physical-chemical and biological properties of the wastes. The criteria are established by categories according to which the assessment of wastes is carried out.

5. Hazardous properties HP4, HR6 and HR8 are assessed on the basis of threshold values for individual substances. If the substance is present in the wastes with concentration below the threshold value, it is not included in the evaluation process.

As a result of the study:

- A unified national approach to the procedure of classifying of each specific type of wastes as hazardous, harmonized with the requirements of the European Waste Legislation was developed;

- The methods of wastes classification to the dangerous for the 15 categories of hazardous properties were worked out.

Using the developed techniques allows obtaining internationally comparable data for the monitoring of environmental programs, as well as high-quality, harmonized data on the creation and management of the hazardous waste.

Using the developed techniques will create a standard basis at European level of the national waste management, development and implementation of the activities of environmentally safe management with hazardous wastes.

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