

Fig. 1. – Germination of common barley on samples

The obtained research results indicate that sewage sludge can be used as a component in the creation of substrate for biological reclamation of disturbed lands. But their number is not advisable to exceed 20 %, but when added to the composition of the sorbents much better performance can be achieved, for example 5 % of the zeolite will allow to add 30–35 % of sewage sludge.

ANALYSIS OF LEGISLATIVE DOCUMENTS OF THE EUROPEAN UNION AND THE REPUBLIC OF BELARUS IN THE FIELD OF WASTE MANAGEMENT

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Legislative documents of the European Union and the Republic of Belarus in the field of waste management have been analyzed.

Keywords: waste management, recycling, waste reduction.

A brief comparative analysis of the Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (hereinafter-the Directive) and the Law of the Republic of Belarus of 27.07.2007 N 271-3 (ed. of 10.05.2019) "On waste management" (hereinafter – the Law) has been carried out.

In article 3 of Directive 2008/98 EC "Definitions" there are such concepts as "dealer" and "broker", they act as intermediaries in the course of waste operations, including those who do not take physical possession of the waste. "Dealer" is engaged in the purchase and sale of waste, and "broker" is engaged in the organization of processing and disposal of waste. Thus, the relationship in waste management is easier to understand. The concept of recycling, which is referred to as any recovery operation in which waste is recycled into products, materials or substances for both the original and other purposes, is also mentioned. This concept is not found in the law of the Republic of Belarus "On waste management", but there is a term "use" of waste, which involves the use of waste for other purposes, including for production, energy, services.

The term "waste prevention" is not found in the law of the Republic of Belarus "On waste management". This term means taking certain measures before a substance, material or product has actually become waste. These measures help to reduce waste by extending its service life, including reusing. Waste prevention reduces the adverse impact of waste on the environment and human health; it leads to reduction of hazardous substances in materials and products.

Article 4 of The Directive "Waste hierarchy» is used as a priority waste management strategy in the legislation and policies of the EU countries on waste prevention and management: prevention, preparation for reuse, waste recycling, other recovery (energy recovery), disposal. In our country, recycling of municipal waste at incinerators and obtaining RDF-fuel from waste, which is recognized as economically impractical, is not applied. The focus will be on increasing separate collection and recovery of secondary resources from waste.

Since 2014, when the European Union adopted a decision on the absence of the concepts of municipal solid waste and industrial solid waste in the legislation; these concepts have been combined into municipal solid waste. This term also includes household waste generated by legal entities.

We have also determined that there are many regulations in European legislation on certain types of waste, for example: Regulation (EC) no 1774/2002 of the European Parliament and of the Council of 3 October 2002 establishing health regulations concerning animal by-products not intended for human consumption. There also

have been a number of regulations on waste of electrical and electronic origin since 2000. In our country, companies for waste processing of electrical and electronic equipment have come into operation in recent years.

A lot of attention in the European Union is paid to the organizing of special weeks of waste reduction, where new waste recycling companies are present, promotions are held. In our country, in recent years, advertising campaigns on the extraction of secondary material resources from waste have also been carried out actively and much attention is paid to the development of the regulatory framework for the separate collection of municipal waste.

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CURRENT DETECTOR

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The studies of the application of the basic radio-electronic components in the electronic circuits for a current preamplifier design are presented. Such equipment as a signal generator, an oscilloscope, a multimeter, a soldering iron is described.

Keywords: radio-electronic components, a detector, a preamplifier, a transistor.

Current detector is a device that detects the presence of charged particles in the working area of space. The preamplifier of such a device is designed to amplify the induction current arising as a result of the passage of charged particles through the working area of the detector. A scheme of the amplification path based on a standard differential amplifier with a subsequent cascade of transistors with a common emitter and a common collector is proposed. Bipolar transistors p-n-p and n-p-n types are used. The schematic diagram of the amplifier path is shown in Fig. 1.

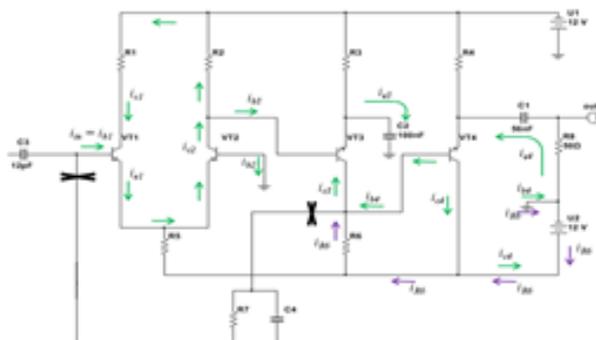


Fig. 1. – Schematic diagram of a preamplifier of a current detector

A prototype of the device and its working scheme have been developed. In the first case, low-pass filters were used (Fig. 2, left), in the second case (Fig. 2, right), positive and negative voltage stabilizers were used. The use of stabilizers allows to avoid the effect of voltage surges during the operation of the circuit, and, therefore, reduces the signal-to-noise ratio.

When assembling the prototype, a large number of wires were used, which leads to the appearance of interference at high frequencies (operating frequencies of the current detector are 5 MHz and higher).