Practical Aspects of TODOS it-Platform Using in Scientific Activity on the Example of Methane Fermentation

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The use of modern information technologies is an integral part of human development. Over the last decades, the amount of scientific information is growth rapidly, and its analysis becoming increasingly complex and costly. Therefore, it is nessary to providing information management in the scientific field [1].

To solve this problem, it was previously suggested to use tools based on the TODOS IT-platform [2–5]. In addition, the using of these tools can be use full under providing of STEM-oriented lessons in the educational process [6-10]. Also, this system allows the use of ranking and filtering tools [10].

However, there was no described detailly mechanism of its usage. In addition, nowadays, it is possible to modernize and optimize user experience of TODOS IT-platform instruments usage.

This work aims provide algorithmically instructions of TODOS IT platform usage on the example of real-life scientific task. [10, 11].

Those instruments were used to provide anaerobic digestion research. Therefore, it is relatively to describe usage process in this field [12, 13].

The general view of the list form is presented in figure – 1, and its view in the form of an ontological graph is presented in figure – 2.

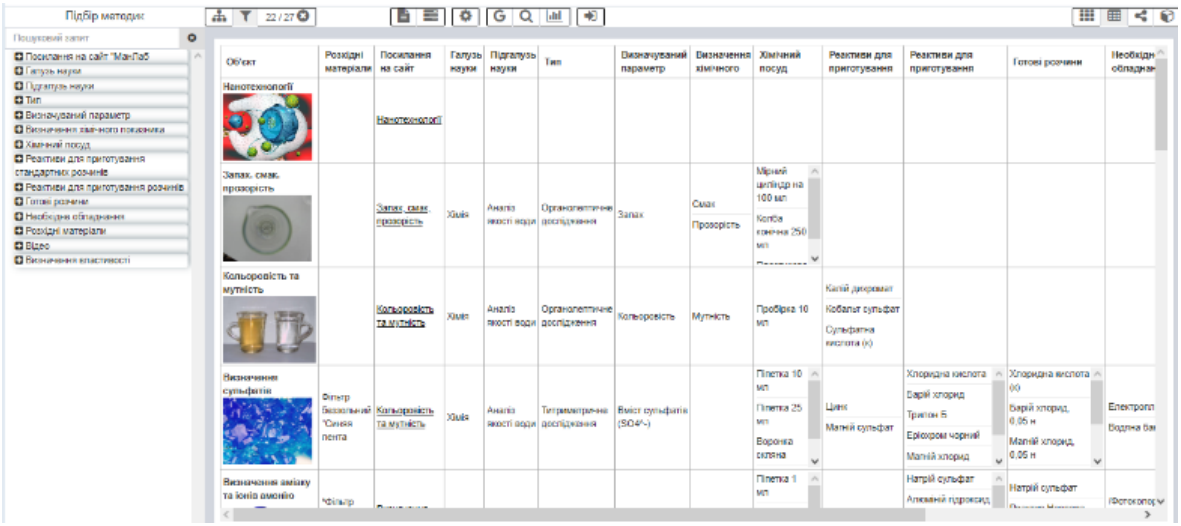

Fig. 1. General view of the system interface in list form

Fig. 2. General view of the obtained ontological graph

This graph is based on the filtering mechanism. The user can use the filter tool in the ontological graph. To do this, it has a filter panel that allows you to select the parameter that he needs. The results of such filtering are shown in Figure 3.

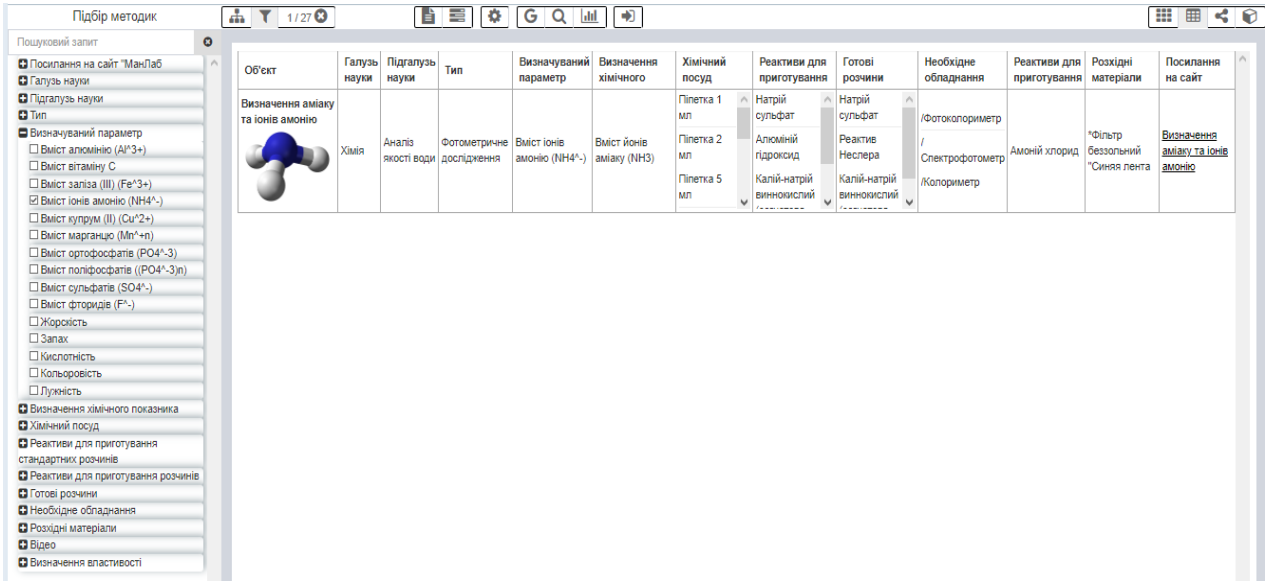

Fig. 3. Filtering results

Consider the possibilities of the ontological IT-platform TODOS as an example of its application in methane fermentation studies. Methane fermentation, as a complex biotechnological process, depends on a number of indicators. These include pH, electrical conductivity, content of volatile fatty acid (VFA), sulfide of total nitrogen and ammonium nitrogen, and others [14–16]. The top of the ontological graph called «Determination of ammonia and ammonium ions» (in Ukrainian «Визначення аміаку та іонів амонію») like every vertex of each ontological graph, contains semantic data. The user of the ontological graph called «Methods finding» (in Ukrainian «Підбір методик») has the opportunity to get acquainted with the necessary reagents, equipment, and methods of determination. For example, researcher have the task to determine the content of ammonium in the bioreactor's substrate. To do this, it is necessary perform a sequence of algorithmic actions:

1. Follow the link ontology4.inhost.com.ua.

2. Find a graph called «Methods finding» (in Ukrainian «Підбір методик») using the search tools and open it.

3. In the filter field called «Parameter» (in Ukrainian «Визначуваний параметр») select filter «Ammonium» (in Ukrainian «Вміст іонів амонію»).

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