# Portable School Laboratory Complex for Pollutants Detection "Enzymolum"

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**Abstract**

Portable school laboratory complex "Enzymolum" for determining the degree of toxicity of various media was created. The toxicity analysis is based on high sensitivity of coupled enzyme system of luminescent bacteria (NAD(P)H:FMN-oxidoreductase and luciferase) to a wide range of pollutants.
Laboratory complex "Enzymolum" consists of two main components: immobilized reagent of the same name "Enzymolum" and portable luminometer "LumiShot". Copyrights of these products are reserved.

The analysis takes 1-2 minutes and is carried out as follows: reagent "Enzymolum", test sample, and bioluminescent reaction initiating substrate (FMN) are successively added into the cuvette. After the cuvette is placed into the luminometer "LumiShot", luminescence curve is displayed in the PC application. The degree of toxicity of the test sample is determined by a relative decrease of maximum bioluminescence intensity in comparison with the control measurement in distilled water.

To date, guidelines for nine laboratory works have been developed: "Testing of water pollution", "Testing of snow pollution", "Testing of soil pollution", "Testing of the trees leaves pollution", "Safety evaluation of the use of detergents for dishes", "Purity analysis of the surface of fruits and vegetables", "Effect of carbonated beverages on enzymes of luminescent bacteria", "The proof of the harm of smoking by using a bioluminescent method", "The proof of the harm of alcohol consumption by using a bioluminescent method". Creation of methodical instructions for laboratory works continues. Moreover, one of the main advantages of laboratory complex "Enzymolum" is that it helps to carry out actual scientific research projects on biology and ecology at school by children themselves.
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