



ITMO UNIVERSITY

Saint Petersburg, Russia

Sensor for determining the composition of a fluid

Prof., Dr. Sc. Gennadi Lukyanov, Ilya Kovalskiy

Sensor for determining the composition of a fluid

The composition of substances is usually determined using optical methods, for example, spectroscopic ones. Such analysis is often performed in a special laboratory and takes quite a long time. Therefore, such methods are practically inapplicable for analyzing the composition of a liquid during the production process.

There are examples of processes where the analysis of the composition in the production process is extremely relevant: the process of water purification; processes associated with the control of the composition of oil in oil pipelines; control of the composition of fuels; determination of the composition of vegetable oils..

There are also chemical methods that are also time consuming to analyze. For many applications, it is very important to be able to carry out analysis directly in the production process. It is rather difficult and expensive to implement them using the existing methods.

In addition, these methods have such a disadvantage as high cost. We propose a new method for analyzing the composition of a liquid. The main advantages over existing methods are the increased speed of analysis (about 0.1 s), the possibility of using it directly in the production process, without taking samples, ease of manufacture and use, and low cost.

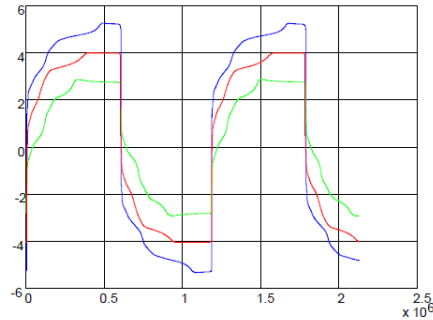
Sensor for determining the composition of a fluid

The principle of operation of the sensor is a nonlinear response of the medium to an electrical impulse. Below are the signals at the output of the measuring cell when analyzing different types of water.

Blue- tap water

Green – Yessentuki

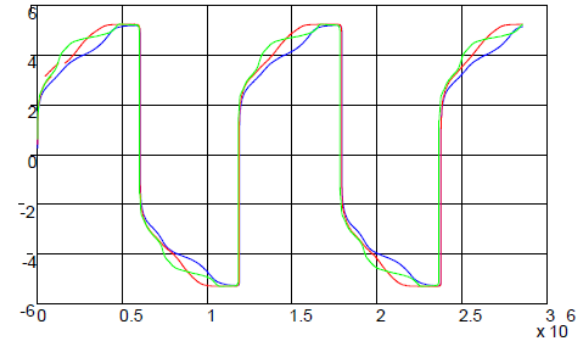
Red is bottled water



Blue- primary treatment

Green – tap water

Red water from sewage

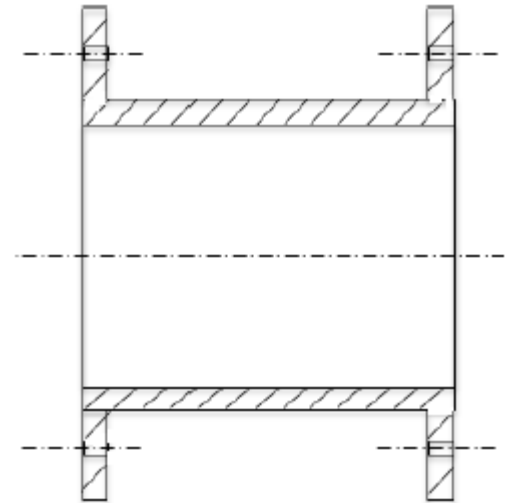


Sensor for determining the composition of a fluid

Laboratory prototypes of measuring cells



Sensor design for tie-in a pipe



Sensor for determining the composition of a fluid

Conclusions

1. The proposed sensor has a short analysis time (<0.1 s);
2. Can be used directly in the production process in the mode;
3. Tested on fluids such as water, greasy oils, motor fuels;
4. Has a low price.

Thanks for attention!

www.ifmo.ru

IT³MO^{re} than a
UNIVERSITY