AMERICAN Journal of Engineering, Mechanics and Architecture
Volume 01, Issue 09, 2023 ISSN (E): 2993-2637

Identification of the Electroflotocoagulation Cleaning Process at a Car Washing Station

Karimov Abror Qayumovich
Institute of counter-engineering economics

Abstract: This article discusses the process of identification of the area of car wash stations and agricultural machinery containing oil products, surfactants and other pollutants by electro flocculation.

Keywords: Oil, active substance, wastewater, electrolysis, hydroxyl group, concentration, automation, oxidation.

The most dangerous for the environment is the area of car wash stations and agricultural machinery, which contain oil products, surfactants and other pollutants. According to the research carried out at the Department of Surface Transport Systems of Tashkent State Technical University named after Islam Karimov, as well as information from other sources, oil products and surfactants with physical, chemical, electrical and hydrodynamic properties by means of electrochemical action A number of factors influencing the processing of waste water have been identified. In the automation of wastewater treatment processes, the principle of diversion control is adopted as the main direction. The pollution concentration of the water entering and leaving the device is monitored using a conduct metric measurement sensor. The principle of operation of the device is based on the use of molten electrodes in electrolysis. As a result of electrolysis, the details are restored, the components of the cleaned waste are reduced and the oxidation process takes place. Divalent iron ions are transferred to water, they combine with the hydroxyl group and are good substances that destroy harmful substances [1,2].

At the same time as electric foaming, the process of electro flotation is also carried out. Oxygen and hydrogen bubbles separated from the electrodes collect the dirty layer on the surface of the part under the influence of a non-homogeneous electromagnetic field and bring the collected foam to the top. The results of experimental studies were used for the mathematical model of the process. According to them. The information scheme of the control object shown in Fig. 1 is defined.

Figure 1 - *Information management scheme.*

X(t) - input parameters; Y(t) – control parameters; U(t) are output parameters. When developing a scheme for automating the cleaning process, the following requirements for the control system are studied:

1. Ensuring process suitability and reliability of cleaning equipment.
2. Exclusion of automatic and manual control at the same time. Switching from automated control to manual control or vice versa should not affect the operation of the cleaning device, causing it to stop.
3. Turn off the device and turn on the alarm when the cleaning process is broken. Blocking after emergency stop before prohibiting the automatic or remote start of the technological process.
4. After completing or suspending the cleaning process, the control system should be ready for the next start.

The functional diagram of the automated system (Fig. 2) allows full control of the main parameters of the cleaning process. To do this, the operator enters the initial pollution data into the computer, which are produced by the oil product of the waste, and gives the command to start cleaning. Based on the entered data on the level of pollution of waste water, the program module selects from the database the corresponding parameters of the electric field strength in the electric fan and the magnetic field strength in the hydro cyclone and transfers these values to the control unit.

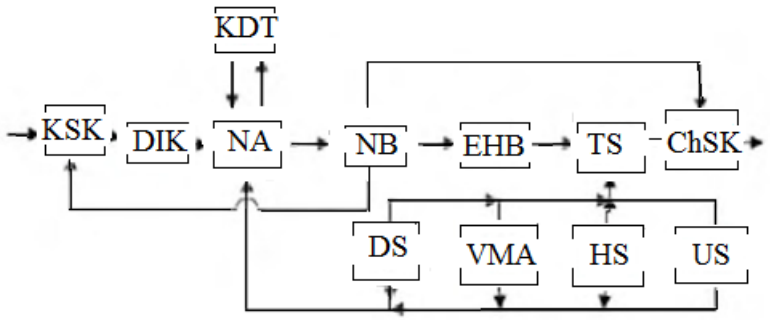

Figure 2. *Functional diagram of the automated system for electromagnetic regulation of the washing currents of auto tractors:*

DIK - initial pollution concentration NA – control apparatus (programmable control), KDT – computer software; NB – control unit; EHB – electromagnetic computing unit; TS - purified water US – treated water with conductivity sensor; DS - level sensor; HS – temperature sensor; VMA – Instruments for determining the amount of hydrogen; KSK, ChSK - inlet and outlet solenoid valves. The server part of the automated system stores basic data on the optimal values of the electrochemical parameters of the pollutants coagulated under the influence of the electroflotocoagulator and the electromagnetic cyclone.

The conclusion is that if the proposed electrochemical reaction device is used at the car equipment and agricultural machinery cleaning stations in our Republic, high efficiency will be achieved in reducing water consumption and saving electricity.

Literature

1. В.В. Кафаров, М.Б. Глебов. Кимёвий ишлаб чикаришнинг асосий жараёнларини математик моделлаштириш. - М.: Олий мактаб, -1991. - 400с.
2. Eshqobilov O.X., Daminov L.O. Materialshunoslik. O‘quv qo‘llanma. –Qarshi: “Intellekt”, 2021. –255 b.
3. Umarov E.O. Materialshunoslik. Darslik. -T.: “Cho‘lpon”, 2014.
4. Eshqobilov O.X., Tursunov Sh.S., Ismailov I.I., Berdiyev Sh.A. Materialshunoslik va konstruksion materiallar texnologiyasi. O'quv qo'llanma. – Qarshi: "Intellekt", 2023. -215 b.