

DEVICE FOR ELECTROCHEMICAL TREATMENT OF INDUSTRIAL WASTEWATER WITH ENVIRONMENTALLY CLEAN INEXHAUSTIBLE ENERGY SOURCE

DISADVANTAGES OF EXISTING UNITS

High expense of water treatment from cyan and tocyan groups
Need to treat water from utilizing catalyses
Need to utilize substances received during the treatment
High amount of water used by enterprises



Red River
in Zaporizhzhya city (Ukraine)



Industry zone in Zaporizhzhya city (Ukraine)

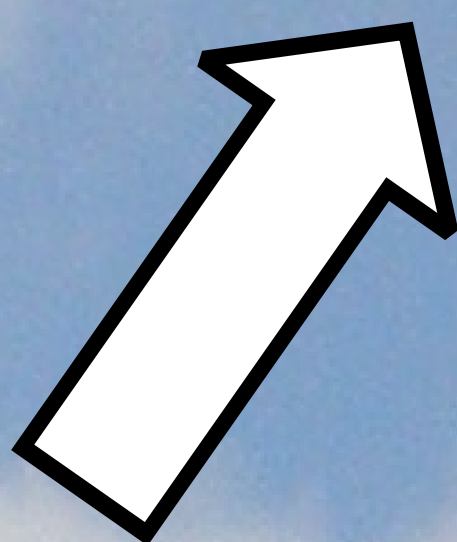
ADVANTAGES OF INVENTED UNIT

Reduction of use of water
Use of treated water in a closed (circular)water supply cycle of enterprises
Utilization of substances received during treatment for industrial use
Reduction of emissions that are detrimental to the environment
Reduction of the cost of treatment



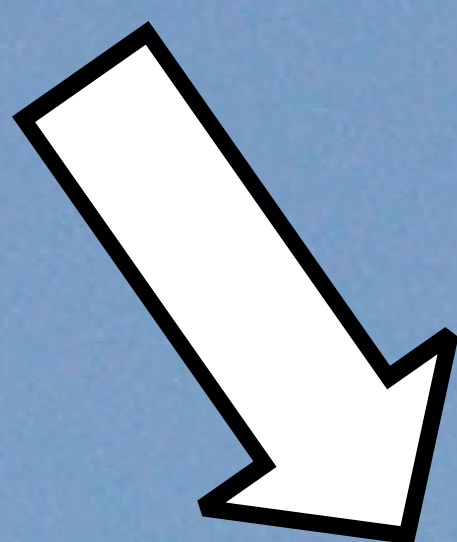
CONSTRUCTION

The offered **wastewater treatment unit** consists of:
the wastewater holding tanks (1) and (7);
filters (2) and (8) for removing mechanical pollutants from wastewater;
the liquid run-out speed controls (3) and (9);
the tank (4) for storage and supply of sodium chloride;
the mixer (5) of water that contains cyan and/or thiocyanogen groups with sodium chloride;
the device (6) for electrochemical treatment of water;
the mixer (10) of water that is received after electrochemical treatment of water that contains cyan and/or thiocyanogen groups with water that contains aromatic hydrocarbons with functional groups of electro donor nature or water that will be used for heating networks;
the device (11) for wastewater mixture treatment;
the holding tank (12) for collecting treated water;
the power supply unit (13).



MODE OF OPERATION

The **wastewater treatment unit** operates in the following way: wastewater that contains cyan and/or thiocyanogen groups is directed through the filter (2) for removing mechanical particles of more than 0,0001 m to the wastewater holding tank (1). Further water is directed through the liquid run-out speed control (3) to the mixer (5) of water that contains cyan and/or thiocyanogen groups with sodium chloride, sodium chloride is also directed from the tank (4) for storage and supply of sodium chloride to the mixer (5). While sodium chloride (NaCl) is being mixed, it dissociates into ions Na^+ and Cl^- . If needed, pH can be controlled in the liquid by adding to the mixer (5) corresponding substances. The prepared wastewater is directed to the device (6) for electrochemical treatment of water, where it is treated from cyan and/or thiocyanogen groups. After electrochemical treatment water contains up to 200 mg/l of active free chlorine. After that water is directed to the mixer (10) and mixed with water that contains aromatic hydrocarbons with functional groups of electro donor nature or with water that will be used for heating networks.



Water that contains aromatic hydrocarbons with functional groups of electro donor nature or water that will be used for heating networks is directed through the filter (8) for removing mechanical pollutants to the wastewater holding tank (7).

Water is further directed through the liquid run-out speed control (9) to the mixer (10) of water that is received after electrochemical treatment of water that contains cyan and/or thiocyanogen groups with water that contains aromatic hydrocarbons with functional groups of electro donor nature or water that will be used for heating networks. The received mixture of wastewater is directed to the device (11) for wastewater mixture treatment. After treatment water can be stored in the holding tank (12) with a possibility to control a flow speed. In such a way treated water can be used in a closed circle.



Model of unit for electrochemical treatment of industrial wastewater

RESULTS OF OUR WORK ARE:

1. Analysis was conducted to eliminate disadvantages of the already existing units for treatment of wastewater that contains cyan and thiocyanogen groups and the units that can be used for this purpose too.
2. The new design of the wastewater treatment unit and its components was developed to eliminate some revealed disadvantages.
3. The working models of the wastewater treatment unit and its components such as the wastewater treatment unit, the device for electrochemical treatment of water, the wind engine, the inductor generator were worked out and produced.
4. Main regimes of the generator operation were experimentally analyzed. Its characteristics such as idle strike, short circuit, external and regulated functions, rotation frequency generator dependence were defined and registered.

5. Workability and effectiveness of the device for electrochemical treatment of water were experimentally tested.
6. Some results of the study were published in the specialized scientific journal Promishlennaya Energetika [Andreev A.H., Zaitsev E.Y., Levin R.E. 2005. Inductor generator with gear rotor. Promyshlennaya Energetika. NTF Energetika: Moscow, No. 6, pp. 28-30.].
7. We received 6 declaration patent of Ukraine for the invented wastewater treatment unit and parts of it.
8. Simultaneously while the wastewater treatment unit being developed, new designs of its components such as the device for electrochemical treatment of water, the wind engine, the inductor generator being also conducted.

REACTIONS

