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INFLUENCE OF THE QUANTITY OF PUMPINGS OF GEAR PUMP ON THE DOSAGE OF HYDRODYNAMIC ACTIVE POLYMERS

During the frequency regulation of electric drive of a pump the minimum possible its power consumption is provided.

The adjusting the gear pump, by changing of frequency control was investigated the effect of the quantity of overflowed solutions of hydrodynamically active polymers (HDAP) on their destruction.

The research was carried out at the laboratory plant, developed at the Department of Hydraulics and Sanitary Engineering, Lviv Polytechnic National University. The frequency of rotation of the regulated electric motor was changed by changing the voltage. The use of a polyacrylamide (PAA) aqueous solution was used as HDAP.

OJSC "Oriana" (Kalush city, Ivano-Frankivsk district, manufacturing 1999 according to TU 6-01-1049-92) with concentration of 0,00001 kg/kg. A solution of PAA was passed through a gear pump $n = 10$ times.

The supply of the gear pump Q was measured in a volumetric manner. The power consumption of the pump N_p was determined by the values of the amperage and voltage, which were taken from the stator of the regulated electric motor by means of a multimeter. The relative error of measurement of the volumetric flow rate of the solution of PAA was $\leq 10.7\%$; the same, pump power consumption — $\leq 13.9\%$. The bigger fault of the last value is explained by the fact that this index, albeit primary, is latent.

The dependence $Q = Q(n)$ was constructed for $N \equiv N_{\max} = \text{const}$ and $N = \text{var}$. In the first case, $Q = 19.3 \dots 20.2$ ml/s ($Q_{\text{av}} = 19.9$ ml/s) at $n = 10$ and $N_{\max} = 21.1 \dots 22.3$ W ($N_{\max} = 21.6$ W). This indicates that the gear pump does not cause degradation of the PAA study solution. In the second case, $Q(n = 1) = 20.3$ ml/s was obtained at $N = 21.5$ W, $Q(n = 5) = 13.0$ ml/s at $N \equiv N_{\min} = 10.8$ W and $Q(n = 10) = 18.5$ ml/s at $N = 20.2$ W. As can be seen, the change in power consumption of the gear pump leads to change of supply, which allows it to be used as a HDAP dispenser.