

PERFORMANCE PREDICTION OF ULTRAFILTRATION TREATMENT OF POST-
PROCESS COKE WASTEWATER BASED ON THE ASSUMPTIONS OF HYDRAULIC
FILTRATION RESISTANCE MODEL

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Abstract: The post-processes coke wastewater treatment was carried out using flat ultrafiltration membranes with a variable polysulfone concentration in membrane solution (15 wt%–17% wt.) and variable evaporation time of the solvent from the polymer film surface (0s, 2s, 5s). The ultrafiltration process was carried out with the transmembrane pressure of 0.4 MPa and the linear speed of water flow over the surface of the membrane at 2 m / s. For all the membranes transport characteristic of de-ionized water describing the dependence of the volumetric flow on the transmembrane pressure was done. Since none of the ultrafiltration membranes prepared had provided a sufficiently high degree of pollutants removal from wastewater, it was post-treated by RO method. The wastewater treated this way can be used as technical water for coke quenching. The calculations based on the assumptions of the hydraulic model of filtration resistance allowed to predict the efficiency of ultrafiltration membranes used in the process. To that end, for each of the membranes, the following parameters were determined experimentally: the alterations of effluent stream volume over the time of the low-pressure filtration, the total hydraulic resistance and the resistance constituents such as "new" membrane resistance, the resistance [generated](#) by polarization layer and the resistance caused by fouling – reversible and irreversible.