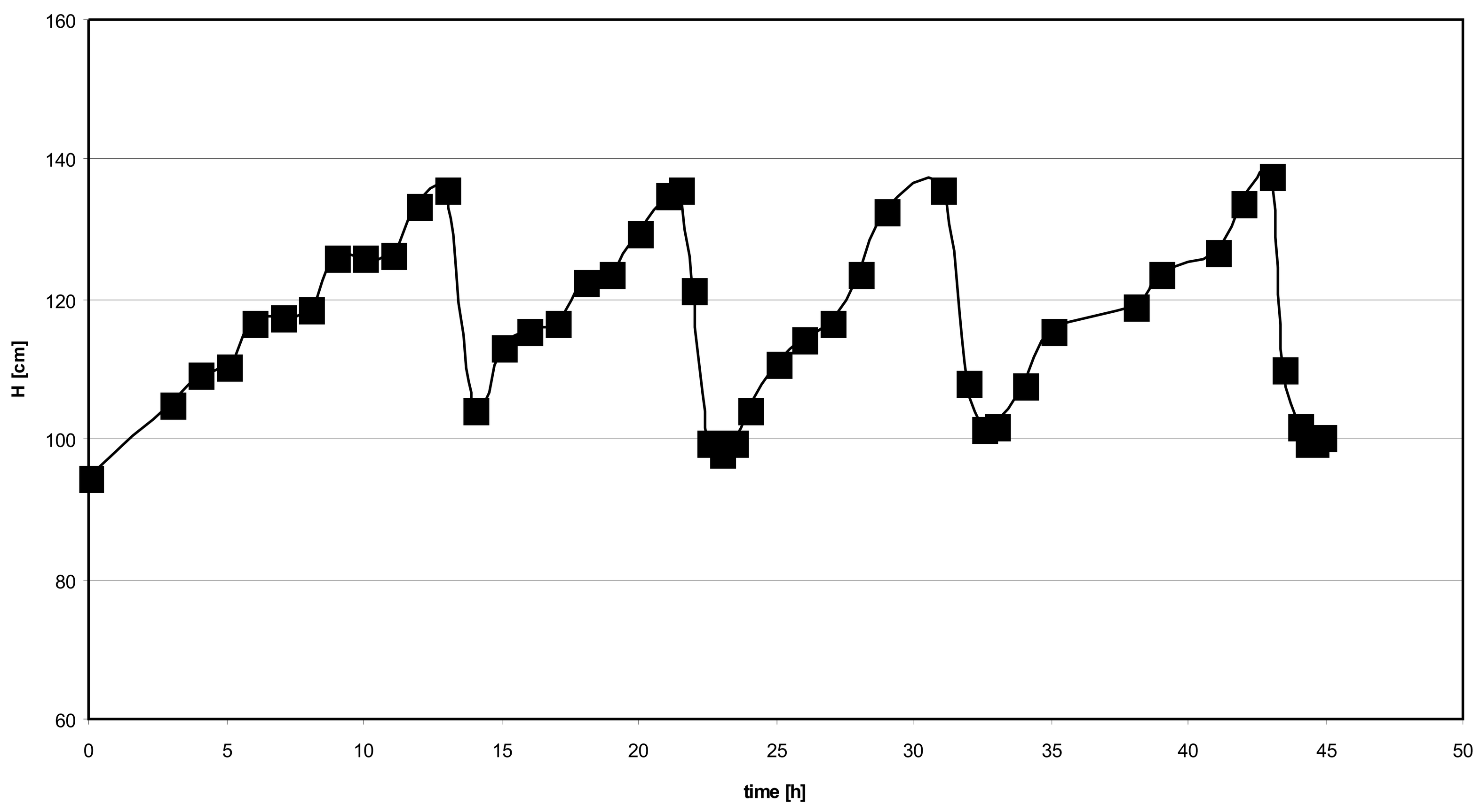
IIMPACT OF FILTER OPERATION ON OUTFLOW WATER QUALITY

Michał Zielina, Wojciech Dąbrowski

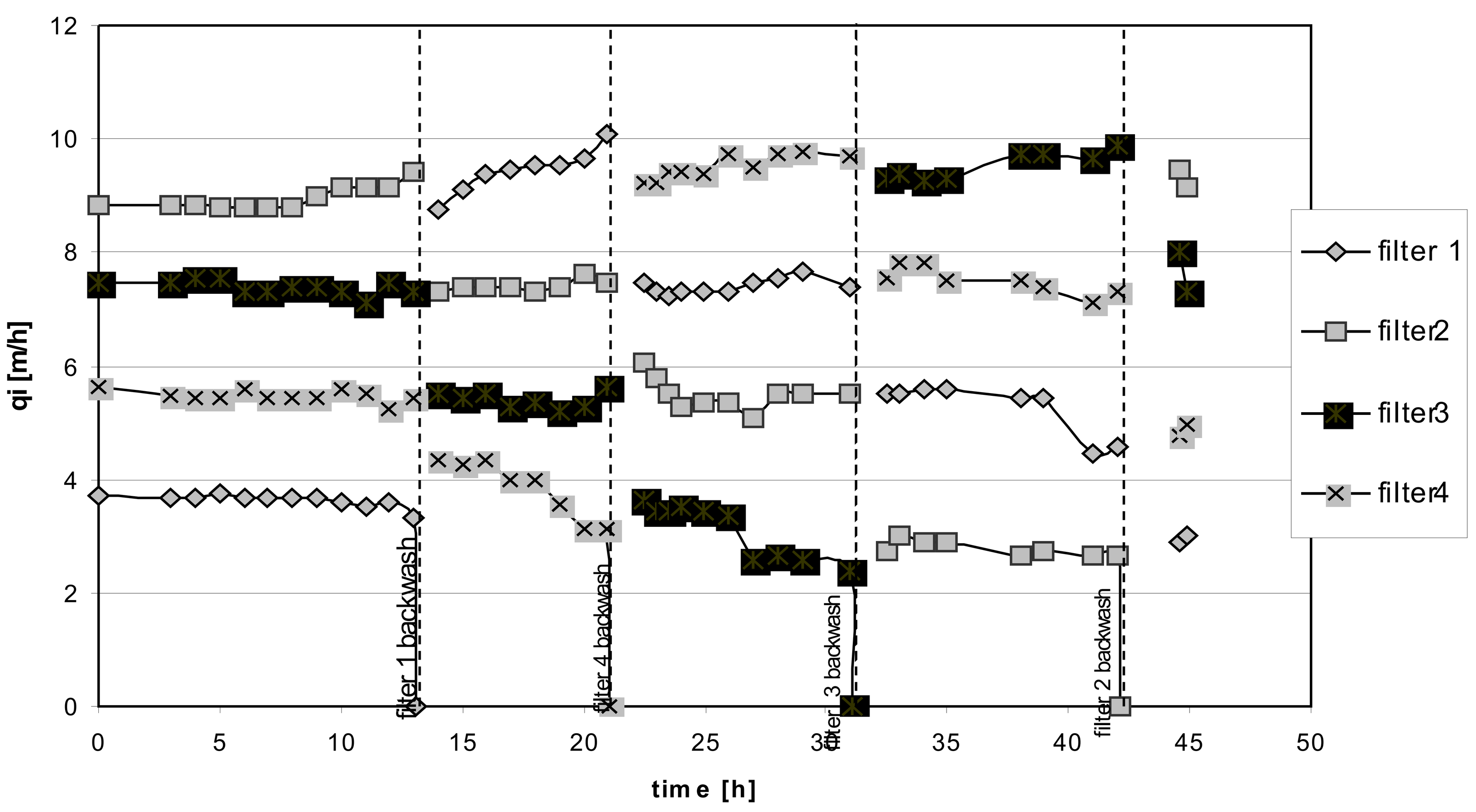
Cracow Unversity of Technology, ul. Warszawska 24, 31-155 Kraków, Poland
mziel@vistula.wis.pk.edu.pl, wdabrow@pk.edu.pl tel. +48-12-628-2551

Usually, rapid filters are operated under constant rate filtration, eventually constant pressure. In practice, filters cooperate each other and rate filtration urgently varied during filtration. Variable Declining Rate Filters operate with orifices located in the outlet instead of the regulators. Appropriate relations between laminar headloss of the media and turbulent headloss of the orifices let to keep declining filtration velocity between limited values. Lower velocity in the end of filtration under Variable Declining Rate system guarantees rarer backwashes of the filters and financial profits. Smooth change of declining velocity during the run and low value in the end of filtration cause that quality of total outflow from Variable Declining Rate Filtration plants should not be poorer than from traditionally operated filter plants.

Experimental research has confirmed the theory. Poorer filtrate quality do not follow economic profits of Variable Declining Rate Filters. Results, even revealed that quality of filtrate produced under Variable Declining Rate Filtration was better for highest ratio of maximum to average rate filtration (q1/qavr=1.4). Similar conclusions were received from numerical simulation realized based on dynamic theoretical model.
However, we did not notice deterioration of total filtrate turbidity from the plant after backwashing another filter in the plant and improving of total filtrate between backwashes of filters, what was observed during numerical experiments



Total headloss through VDR filter plant for q1/qavr = 1.44, H= 139 cm



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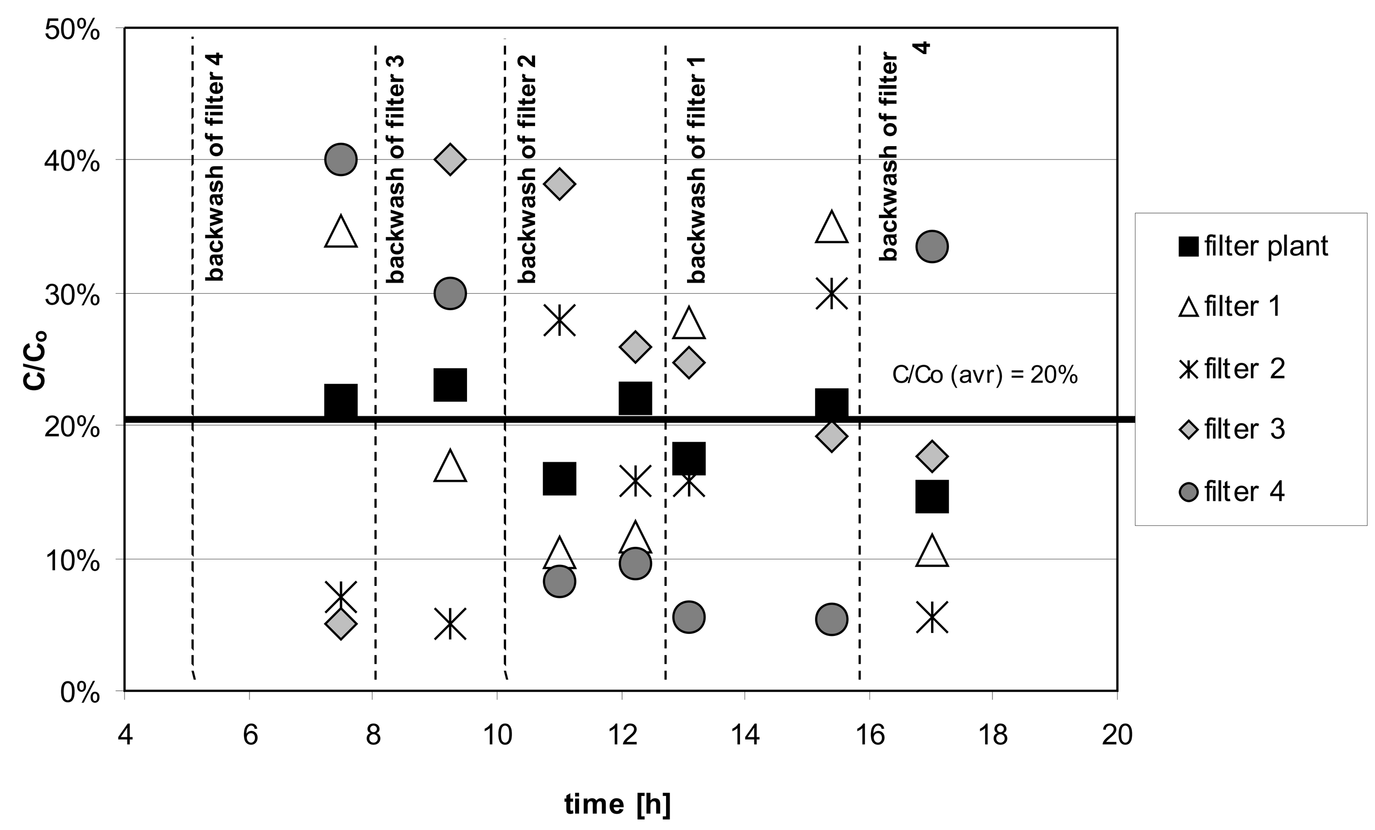
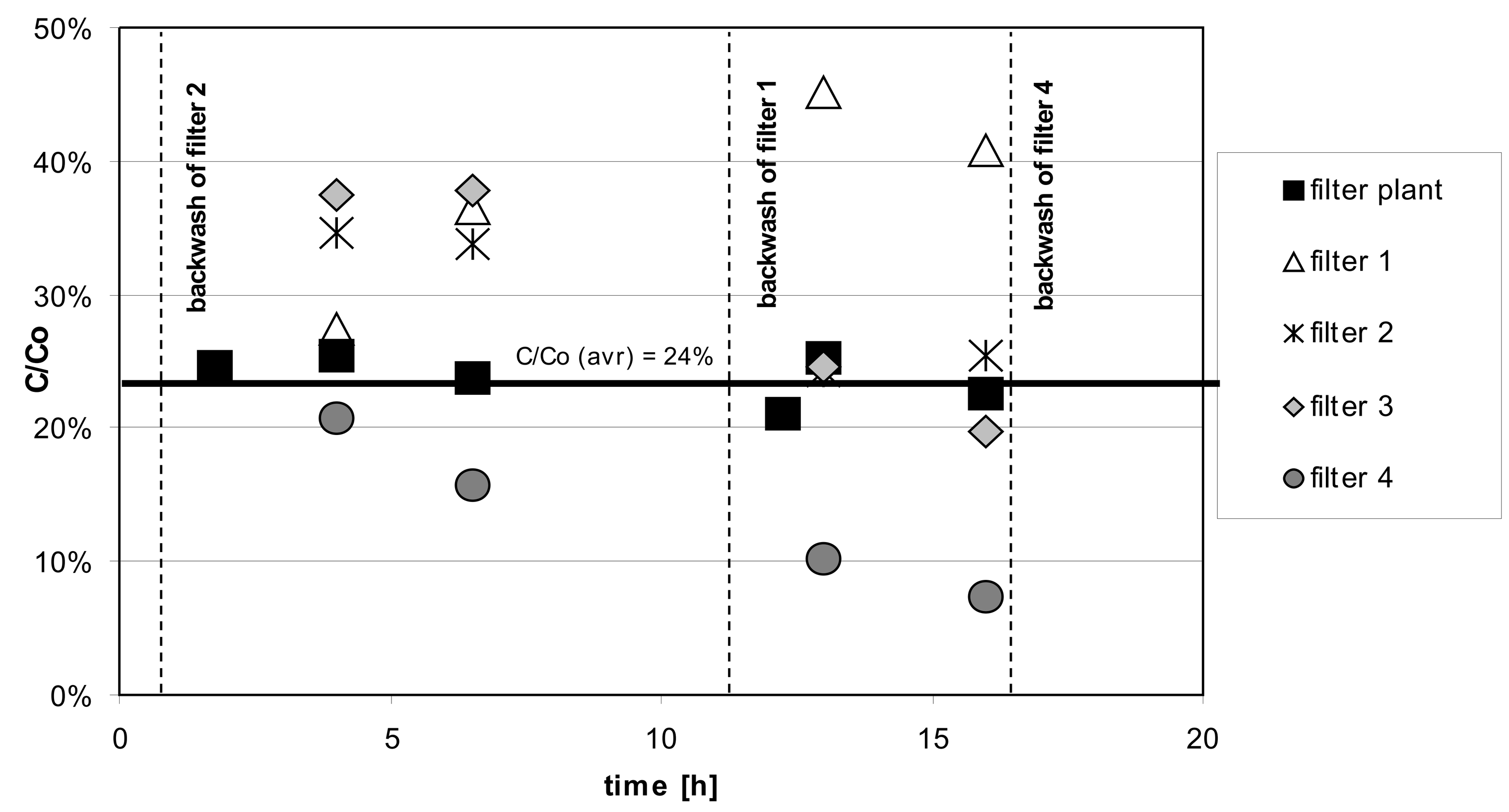
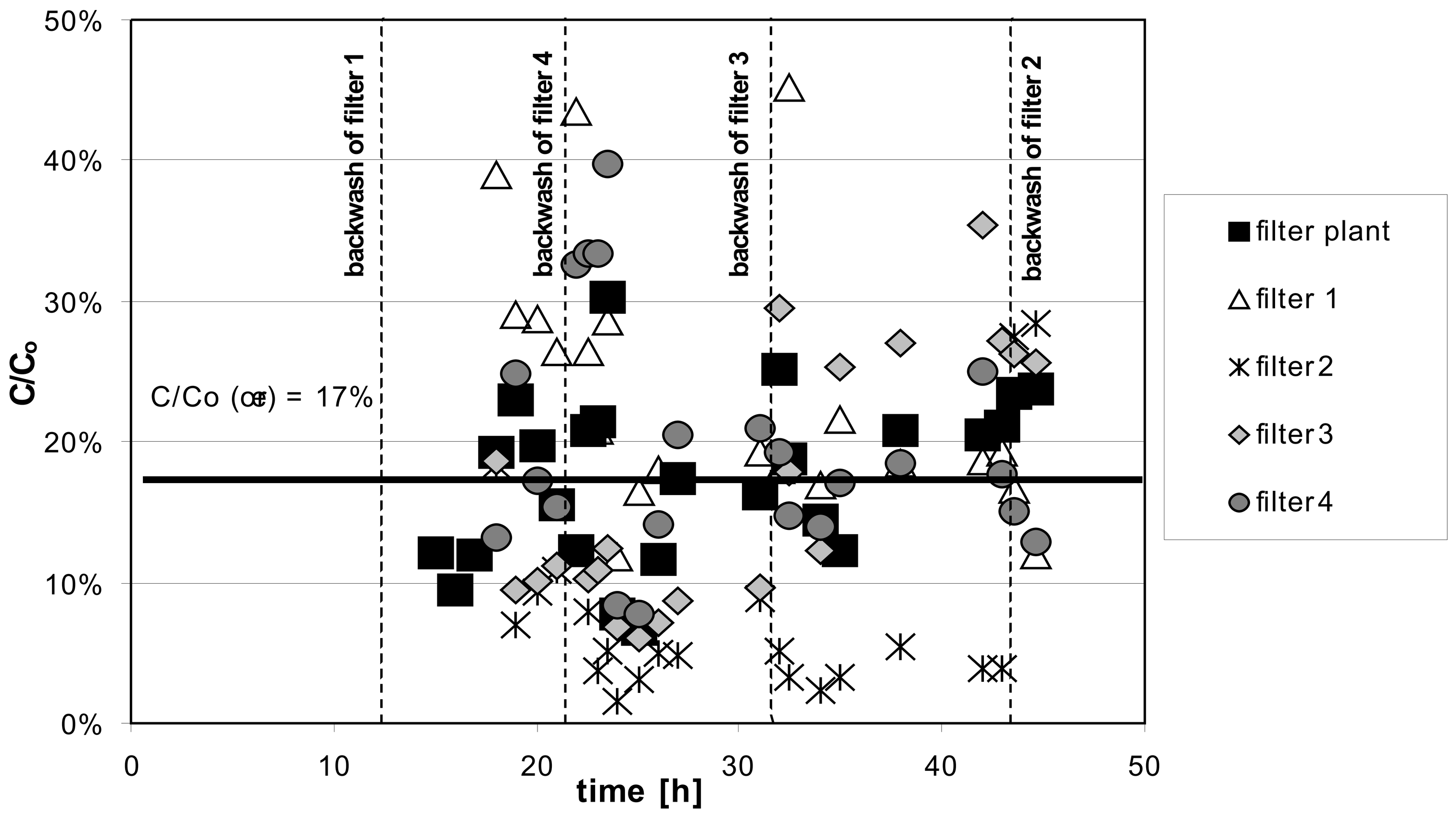


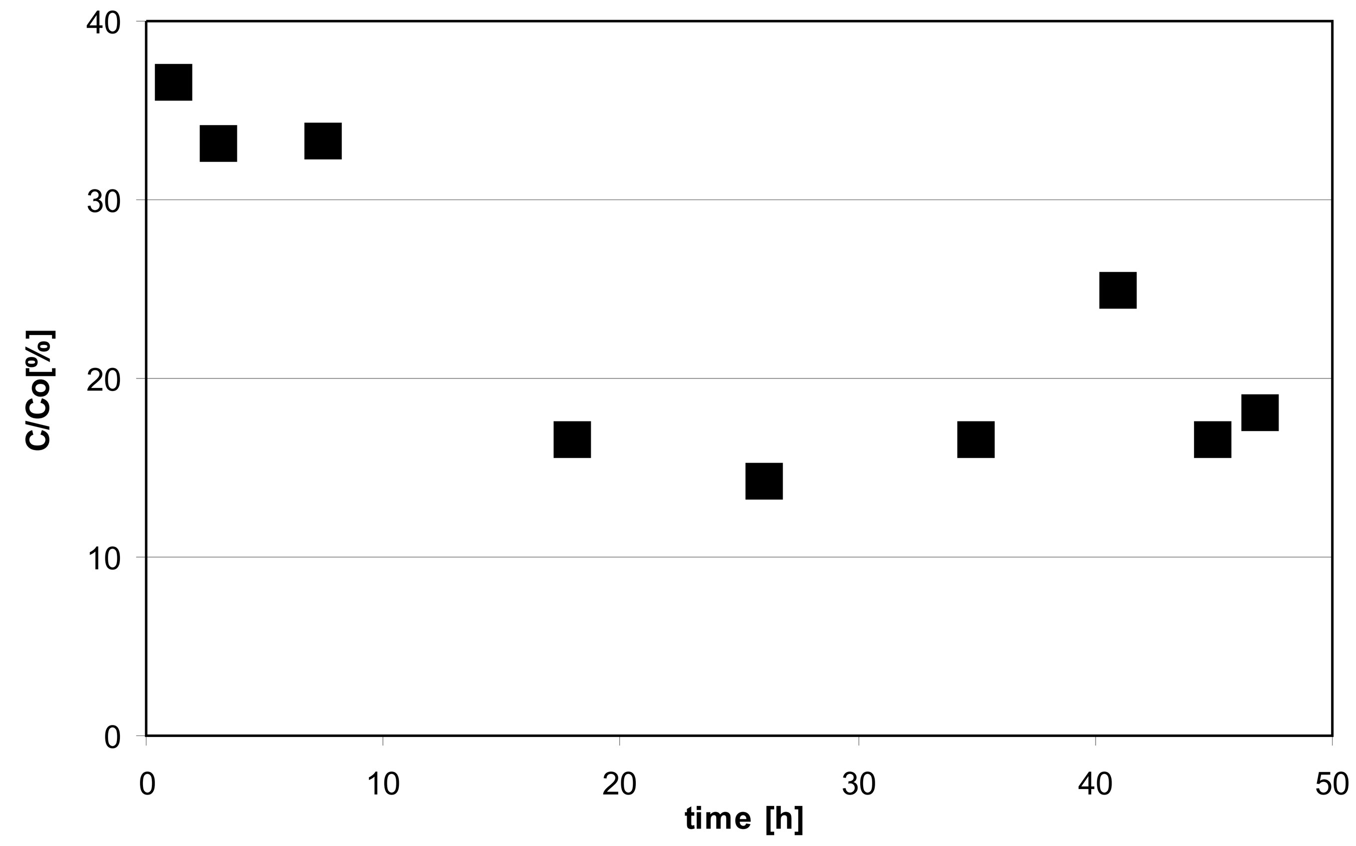
Remaining turbidity in outflow from each of the VDR filter and from VDR filter plant for q1/qavr =1,09 and H=80 cm



Remaining turbidity in outflow from each of the VDR filter and from VDR filter plant for q1/qavr =1,34 and H=118 cm



Remaining turbidity in outflow from each of the VDR filter and from VDR filter plant for q1/qavr =1,44 and H=136,5 cm



Remaining turbidity in outflow from constant rate filter