

Analysis of the Cu^{2+} removal from drinking water by Filbec-Nano™ carbon filtration cartridge

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2 Description of the measurement setup and sampling method

The Cu^{2+} was chosen as a representative of group of **heavy metal** contaminants of drinking water.

The measurement setup is depicted on the fig. 1 below. The sampling procedure utilized the standard tap drinking water. The water was filled into 250 l container and contaminated with defined dosage of CuSO_4 to achieve the targeted concentration of 1.5 mg/l Cu^{2+} ion. The contaminated water was continuously homogenized by circular pump. The water was fed through the tested filter Filbec-Nano™ by pressure-controlled feeding pump at pressure 4 bar and targeted throughput 200 l/hour (approx. 3.3 l/min). The water samples for Cu^{2+} concentration analysis were extracted on the filter inlet and outlet simultaneously at defined values of total throughput in order to calculate the absorption efficiency. After the 250 l (container emptying) the procedure was repeated to examine the absorption efficiency during the expected lifetime of the filter cartridge.

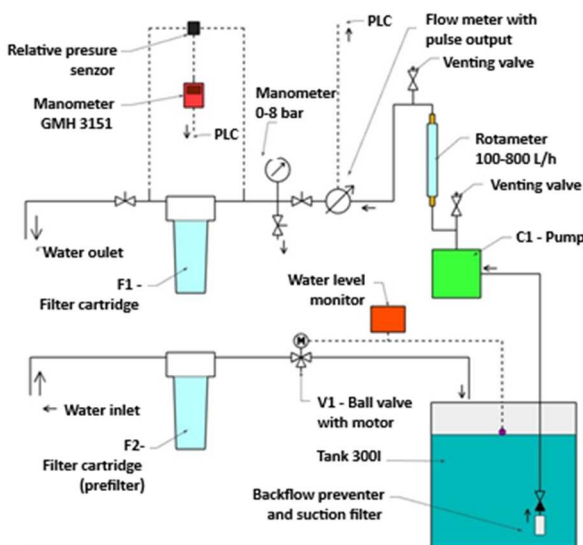


Fig. 1. Scheme of the measurement setup



3 Description of the analytical method

Samples of the water were diluted to standard measurable concentrations and measured by inductively coupled plasma optical emission spectrometry (ICP OES), OPTIMA 2100 DV from Perkin Elmer. The results of performed analyses are concluded in the table below.

4 Measurement results

Total volume [l]	Concentration Cu ²⁺ [mg/l]		Concentration limit in drinking water [mg/l]
	Before filter	Behind filter	
50	1,43	0,04	2,00
250	0,83	0,05	
500	1,09	0,05	

Table. 1 Concentration of analyzed samples

5 Resume

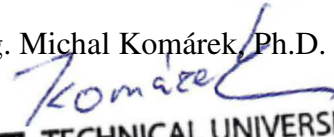

The Filbec-NanoTM filtration cartridge exhibited such an efficient degree of removal of Cu²⁺ that the final concentration (0,05 mg/l) was significantly below the EU Concentration limit of Cu²⁺ standard, which is 2,00 mg/l. Concentration limit of Cu²⁺ is 2,00 mg/l (EU standard - Council Directive 98/83/EC on the quality of water intended for human consumption (adopted in Directive (EU) 2020/2184¹)). Concentration Cu²⁺ in water filtered with Filbec NanoTM **was in all measurement results below 0.05 mg/l.**

6 References

1. Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption; <https://eur-lex.europa.eu/eli/dir/2020/2184/oj>

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