

Analysis of the Ibuprofen removal from drinking water by Filbec-Nano™ carbon filtration cartridge

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2 Description of the measurement setup and sampling method

The **Ibuprofen** was chosen as a representative of **medical drug residues** of drinking water.

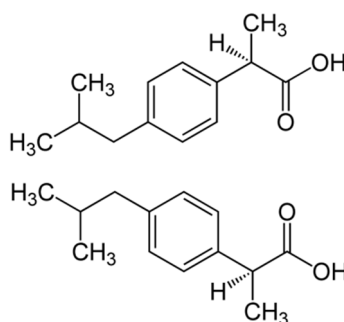


Fig. 1. Ibuprofen chemical structure

The measurement setup is depicted on the fig. 2 below. The sampling procedure utilized the standard tap drinking water. The water was filled into 250 l container and contaminated with defined dosage of Ibuprofen to achieve the targeted concentration of 50 µg/l. 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 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.

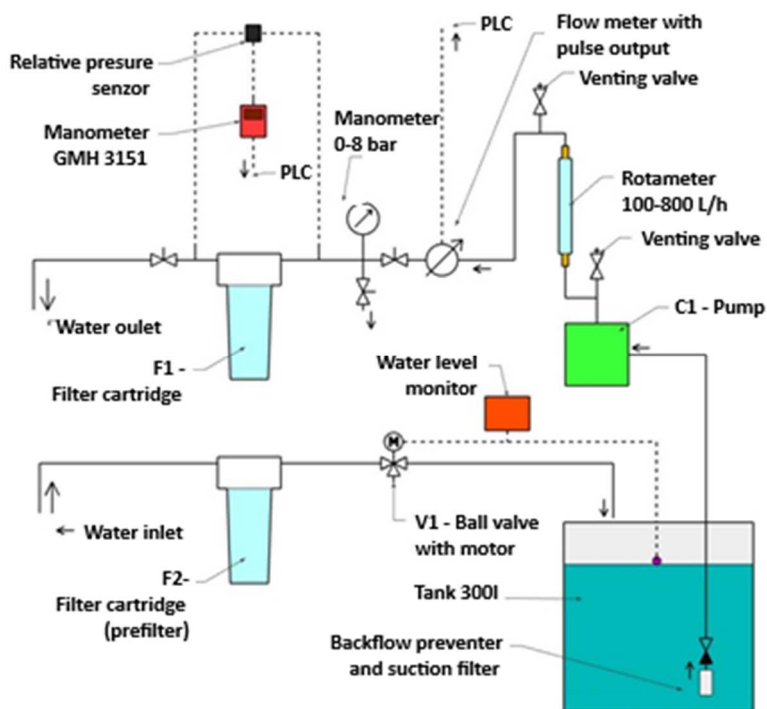


Fig. 2. Scheme of the measurement setup

3 Description of the analytical method

The concentration of Ibuprofen in the sampled water probes were measured by High-performance liquid chromatography HPLC/MS using AB Sciex 3200 QTRAP device equipped with Dionex Ultimate 3000. The results of performed analyses are concluded in the table below.

4 Measurement results

| Total volume [l] | Ibuprofen concentration [$\mu\text{g/l}$] | |
|------------------|---|-----------------------|
| | Before filter | Behind filter |
| 250 | 46 | Under detection limit |
| 500 | 49 | Under detection limit |
| 1000 | 43 | Under detection limit |
| 1250 | 43 | Under detection limit |
| 1500 | 44 | Under detection limit |

Table 1. Concentration of analyzed samples



5 Resume

The concentration of the **Ibuprofen** contaminant behind the **filter Filbec Nano™** was in **all measurements lower than detection limit of the method** (5 µg/l). The concentration limit for drinking water is not quantified by EU standard (Council Directive 98/83/EC (adopted in Directive (EU) 2020/2184¹)).

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>

30. 3. 2021
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