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Drinking Water Engineering and Science Discussions

Interactive comment on "Effect of biostimulation on biodegradation of dissolved organic carbon in biological granular activated carbon filters" *by* K. Tihomirova et al.

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We thank the Stephen Gray for the comments.

1) Could the final DOC values be shown as well in another graph, as this will demonstrate the significant additional DOC removal obtained using this approach.

Example of the reduction of DOC was shown in Fig 3. too (page 83). For clarification I have added additional Figures 1 and 2, which shows DOC changes in BAC sample without LOC and with NaAc and LB addition. The experiments were performed over long period of time, this explain the difference between DOC concentrations in inflow and BDOC in samples.

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The average DOC(BAC) concentration was 6.85±0.16 mg/l in original sample (Figure 1). It increased to 8.59±0.21 mg/l in sample after addition of NaAc biostimulant, respectively and accordingly to definition shown in Fig.3 can be called as DOC(total). The final concentration of DOCmin was 4.25±0.18 mg/l. Thus reduction of DOC or BDOC(total) (see explanation in Figure 3 in publication) in this experiment was 50% in sample with LOC (or (8.59-4.25)/8.59) and BDOC(BAC) (see explanation in Figure 3 in publication) in this experiment was 38% in original sample (or (6.85-4.25)/6.85).

The average DOC(BAC) concentration was 5.02±0.05 mg/l in original sample (Figure 2). It increased to 6.72±0.17 mg/l in sample after addition of LB biostimulant, respectively. Minimal DOC concentration was 4.03±0.13 mg/l. So, reduction of DOC in this experiment was 20% in original sample (or (5.02-4.03)/5.02, see explanation Figure 3 in publication).

2) Additionally there is significant variation in the feed DOC values (ie +/- 0.96 mg/L) and the increase in DOC removal is only 0.5 mg/L. Is this the variation between batches of feed water?

From the publication (page 72, line 24): "The initial concentration of substrate in the BAC sample (DOC(BAC)) for the series of experiments with NaAc and LB was 5.87±0.96 (n = 9) and 4.73±0.19 (n = 7) mgl/1, accordingly." For given DOC measurement this is variation of DOC measurements in inflow to the column during the experiments, and this is because of natural variation of DOC in the BAC samples. As is shown in additional Figures 1 and 2, repeatability of measurements for one samples are much lower (BAC sample 6.85±0.16 (n=3) and 5.02±0.05 mg/l (n=3)) than 0.5 mg/l.

Legends for Figure 1: DOC changes in BAC water sample during biodegradation test (DOC(BAC)=6.85±0.16 mg/l) and BAC sample supplemented with NaAc as a biostimulant after 30h adaptation (DOC(total) =8.59±0.21 mg/l).

Legends for Figure 2: DOC changes in BAC water sample during biodegradation test

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(DOC(BAC)=5.02±0.05 mg/l) and BAC sample supplemented with LB as a biostimulant after 20h adaptation (DOC(total)=6.72±0.17 mg/l).

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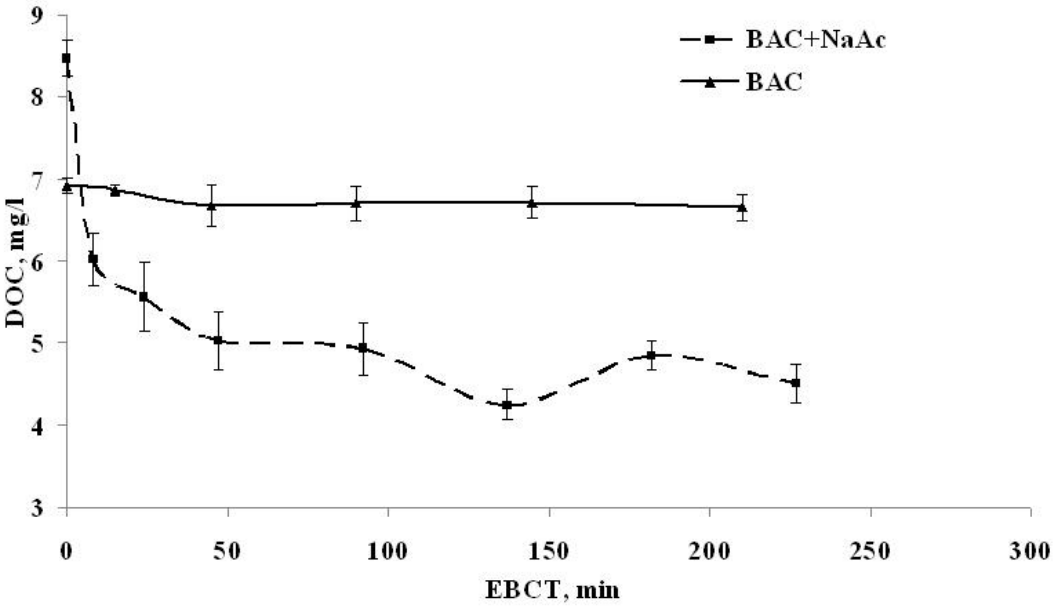

Fig. 1. DOC changes depending on EBCT in water sample with and without adding NaAc as LOC.

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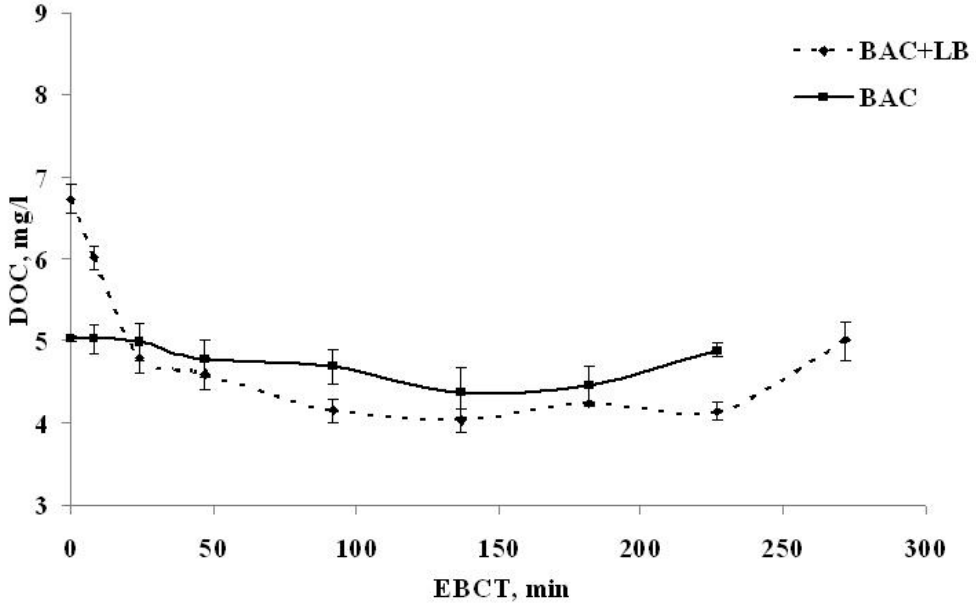

Fig. 2. DOC changes depending on EBCT in water sample with and without adding LB as LOC.

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