

Interactive comment on “Methylated arsenic and antimony species in suspended matter of the river Ruhr, Germany” by L. Duester et al.

Anonymous Referee #2

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Comments on 'Methylated arsenic and antimony species in suspended matter of the river Ruhr, Germany' by L. Duester, L. M. Hartmann, and A. V. Hirner

General comments

This field study measures inorganic and organic As and Sb in suspended particles of the River Ruhr in Germany. The objectives were to (i) examine potential changes in the seasonal cycle of the methylarsenic und methylantimony species content in the suspended material and (ii) compare the biogeochemical behaviour of arsenic and antimony within this specific environment. Results show that patterns of the methylated species of As and Sb are different to each other and it was concluded that the occurrence of these two organic xenobiotics is not related. The methods are well described

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and the authors seem to be familiar with their analytical techniques for As and Sb species identification. There is an issue with the pooling of biogenic and geogenic material as suspended solids. In my mind, plankton should not be used as 'suspended solids' (see below). As for other organometals, such as organic Hg, it is interesting that inorganic As and Sb concentrations cannot predict any of the methylated species. This should be discussed further in the present study including statistical analysis to better understand how concentrations of methylated As and Sb species differ with regard to inorganic concentrations throughout this seasonal study. Moreover, it should be underlined that this study is purely observational in nature and cannot conclusively discuss processes involved in methylation. Lastly, although this paper is mainly descriptive, it would be necessary to put these results into environmental perspectives with regard to availability/biohazards of these xenobiotics in freshwater systems.

Specific comments

p. 1363, l. 3 Add 's' to 'centre'.

p. 1363, l. 9 I suggest changing 'biological activity' with 'autochthonous sources (e.g., microorganisms)'

p. 1363, l. 12 It is not clear what exactly comprises suspended solids? In particular, can aquatic organisms really be called suspended solids because most of them are motile and don't depend, in large, on external suspension forces. I recommend using the term 'particles' rather than 'solids'.

p. 1367, l. 8 The authors may want to replace 'yearly' with 'annual'

p. 1367, l. 14 peak concentrations of chlorophyll-a were clearly associated with phytoplankton development: It is not clear how peak concentrations were associated with phytoplankton development. How was the phytoplankton development measured? Moreover, what did the term 'peak'; in the second part of this sentence refer to?

p. 1368, l. 25 This study did not examine methylation processes, but concentrations of

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organic As and Sb species. Thus, no conclusions about methylation of As and Sb can be made.

p. 1369, l. 1 I assume the authors refer to 'melt' water.

p. 1369, l. 16 'This coincides with the lowest flow rates (when strong rainfall events are ignored)'. Is this correlation statistically significant? Why were strong rain events ignored? Are more careful examination is warranted.

p. 1369, l. 19-26 This is a run-on sentence and it does not discuss results. Moreover, it is not clear how Pb or Fe can be 'indicator elements';for what? Moreover, how can the source of MeSb, presumably of terrestrial origin, be functionally related with Sc?

Table 2+3. Please explain the abbreviated terms in the figure caption.

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