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LETTER TO THE EDITOR

Comments on "Adsorption Sequence of Toxic Inorganic Anions on a Soil" by K. Saeki Bull Environ Contam Toxicol (2008) 81:508–512

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I would like to point out some elementary chemistry errors in the paper entitled *Adsorption Sequence of Toxic Inorganic Anions on a Soil* by K. Saeki published in the *Bulletin of Environmental Contamination and Toxicology* (2008) 81:508–512 which severely compromise major portions of the paper.

The author asserted that he was studying As(V) not As(III) adsorption yet he prepared his As solutions from $NaAsO_2$, clearly a trivalent As(III) salt. Therefore, the author was, in fact, studying the adsorption of As(III). Arsenic(III) is unstable in oxidizing soil environments and readily converts to As(V) which may have happened to some extent during the course of the author's experiments. The author neglected to speciate his As solutions into As(III) and As(V), but instead analyzed for total As using atomic absorption spectrophotometry. If an As speciation analysis had been carried out, the error in redox state would have become apparent and the proportions of As(III) and As(V) could have been quantified.

Throughout the manuscript, the author compared his As(III) adsorption measurements to literature data for As(V) adsorption. This is clearly invalid, especially since the adsorption behavior of As(III) has been shown to be very different from that of As(V) by various authors (e.g., Raven et al. 1998; Goldberg and Johnston 2001; Goldberg 2002) including the author's own work (Saeki 2008). To make matters worse, a significant amount of As(III) was found to convert to As(V) within 2–3 h in soil extracts (Glaubig and Goldberg 1988; Goldberg and Glaubig 1988). It would be impossible to distinguish whether As(III) oxidation were occurring in the solution, on the surface, or both. Therefore, the adsorption experiments would be confounded by the unknown proportions of As(III) and As(V).

The lack of speciation was also a problem for the adsorption experiments using Se(IV) and Se(VI). Selenium(IV) is unstable in oxidizing soil environments and can convert to Se(VI) which may also have happened to some extent during the course of the author's experiments. Therefore, the author's Se(IV) adsorption measurements may be confounded by the presence of an unknown amount of Se(VI). Again, it would be impossible to distinguish whether the Se(IV) oxidation were occurring in the solution, on the surface, or both.

In summary, because of the instability of As(III) and Se(IV) in soil environments and uncertainty as to the proportions of oxidized/reduced species, no conclusions about As and Se(IV) adsorption behavior can be drawn. Therefore, these data are not valid and need to be retracted.

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