

Iron(II)-Catalyzed Oxidation of Arsenic(III) in a Sediment Column

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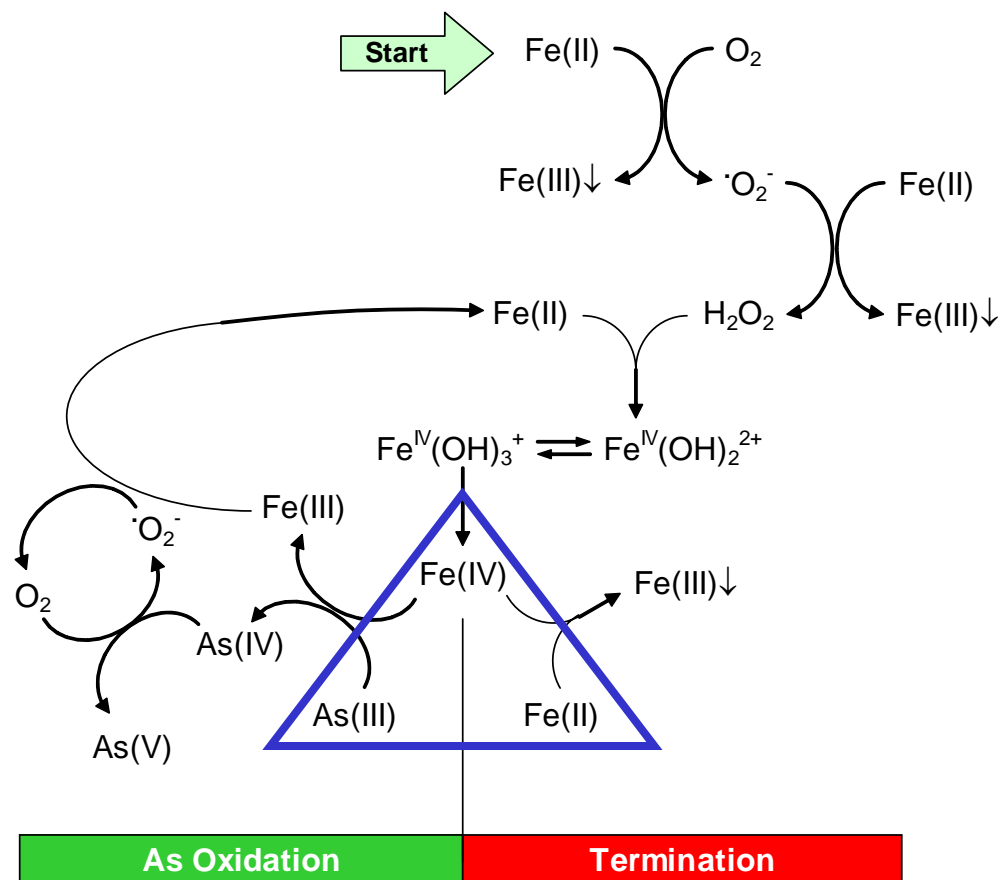


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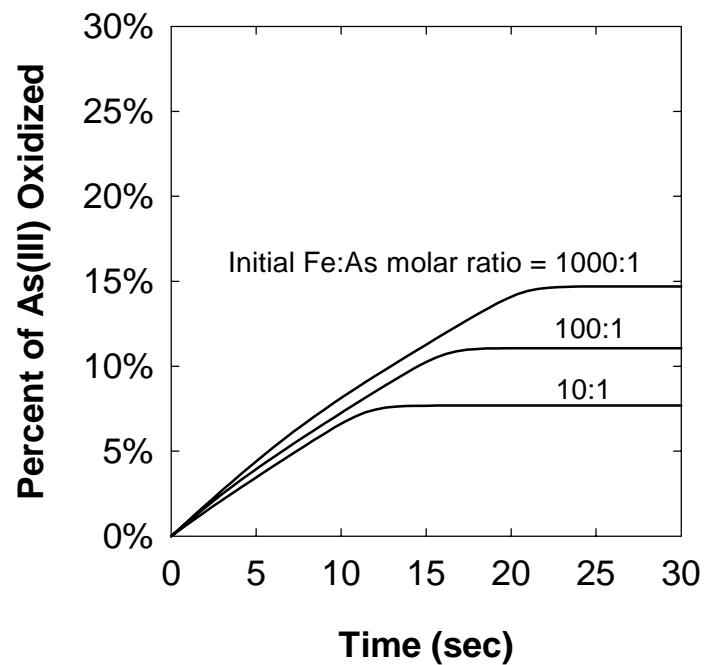
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Introduction



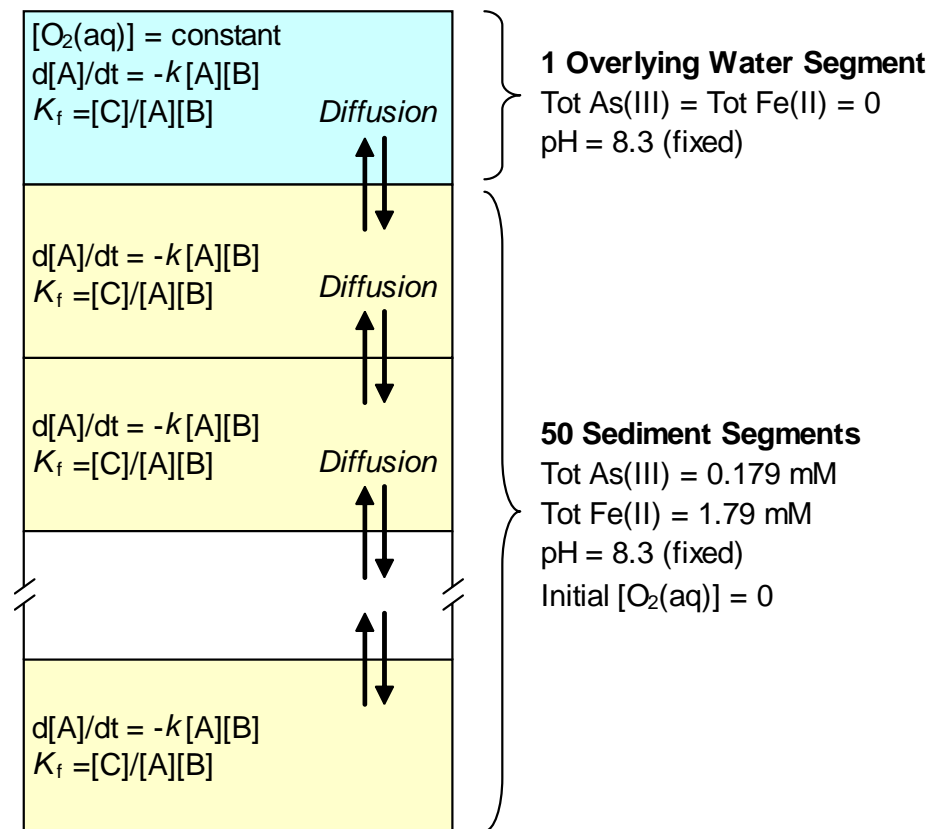
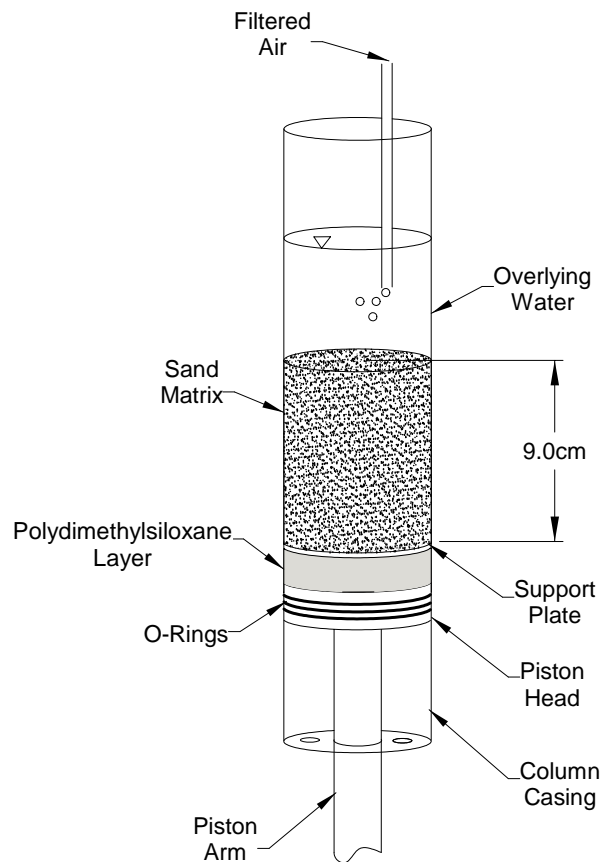
from Hug and Leupin, 2003, *ES&T*

Batch System Model



Materials and Methods

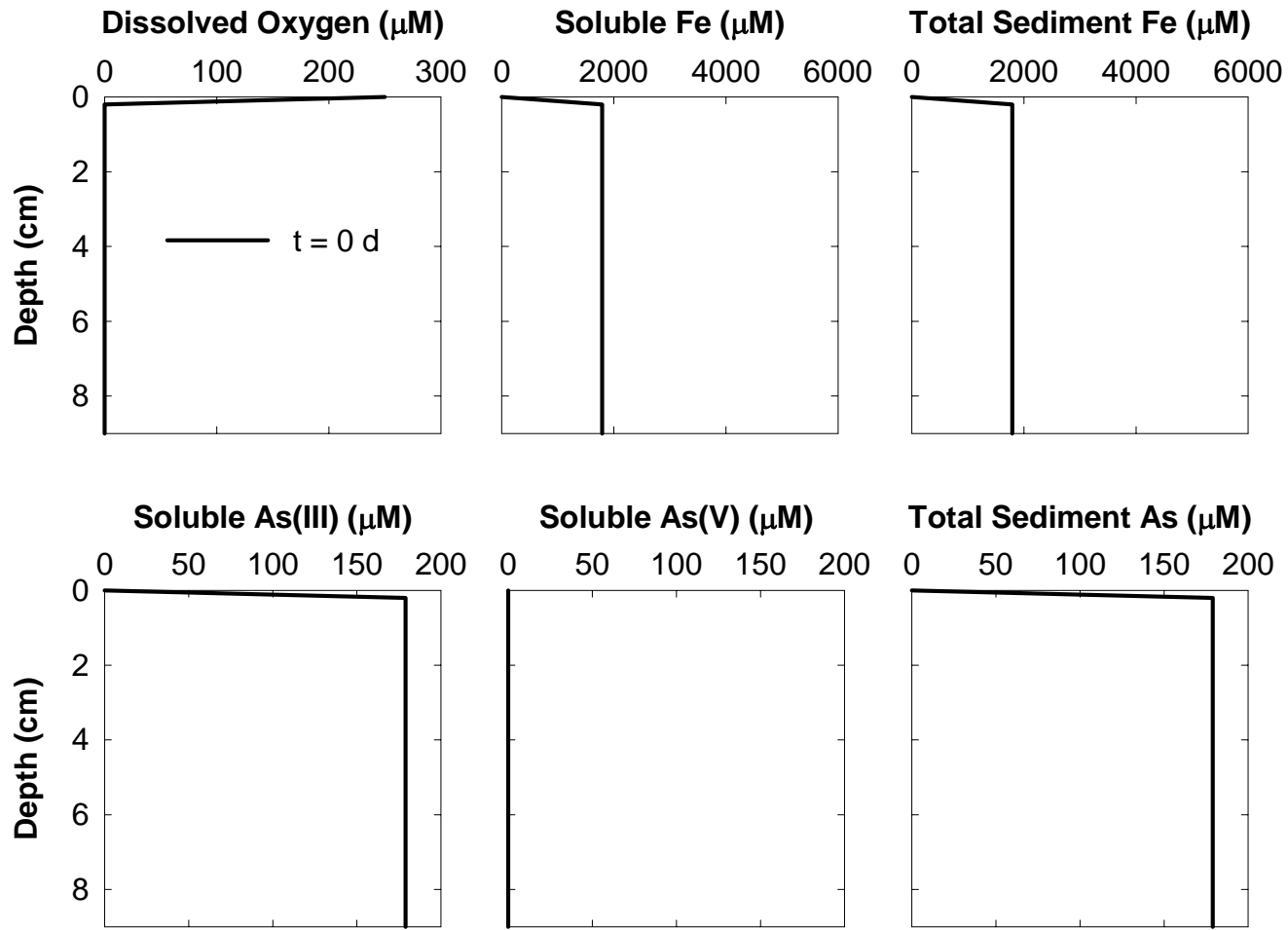
- Sediment column
- Tableau Input Coupled Kinetic Equilibrium Transport (TICKET)



Sand and Fe(III) solids are immobile

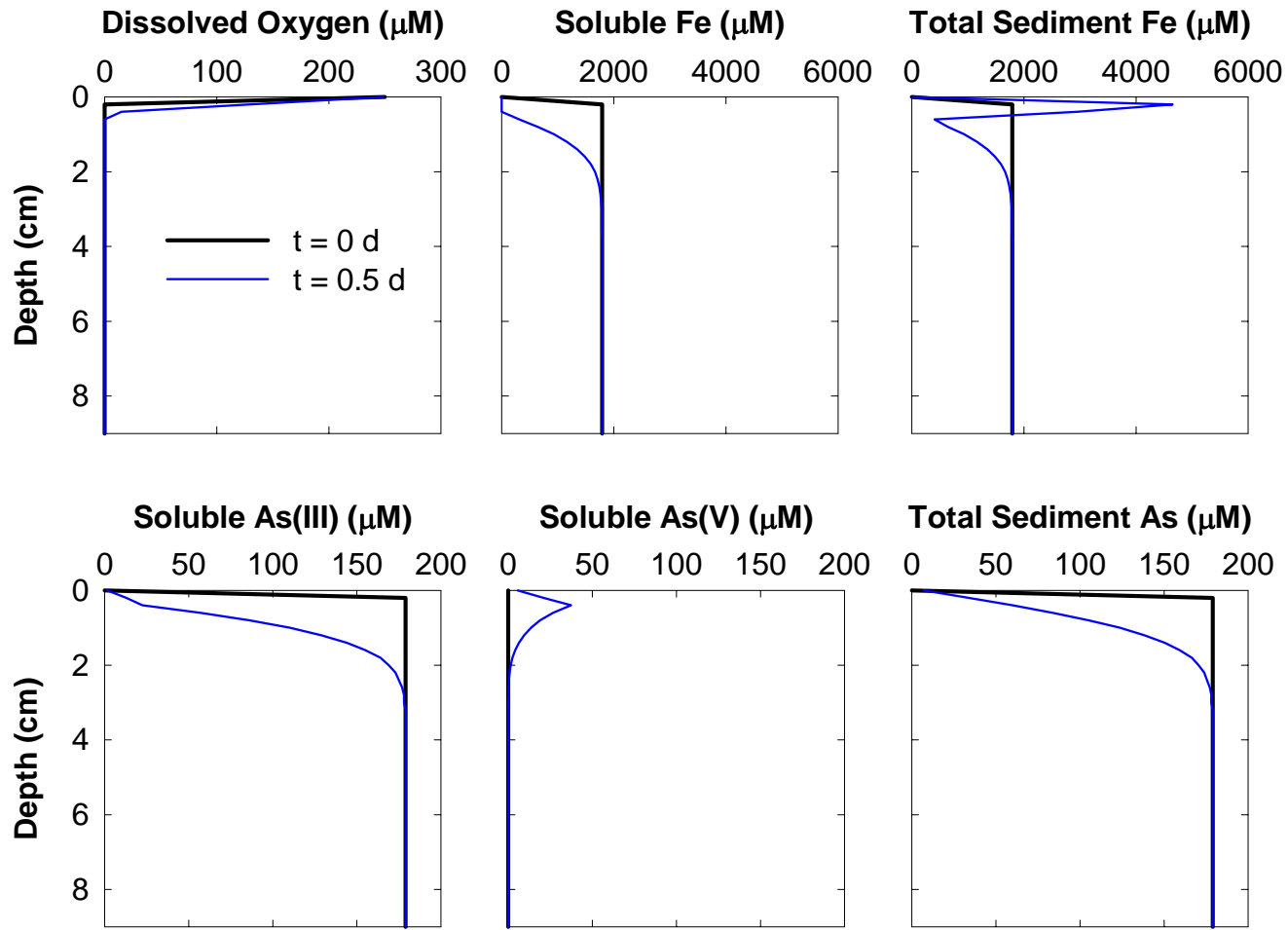
Results (I)

Column Model without Adsorption



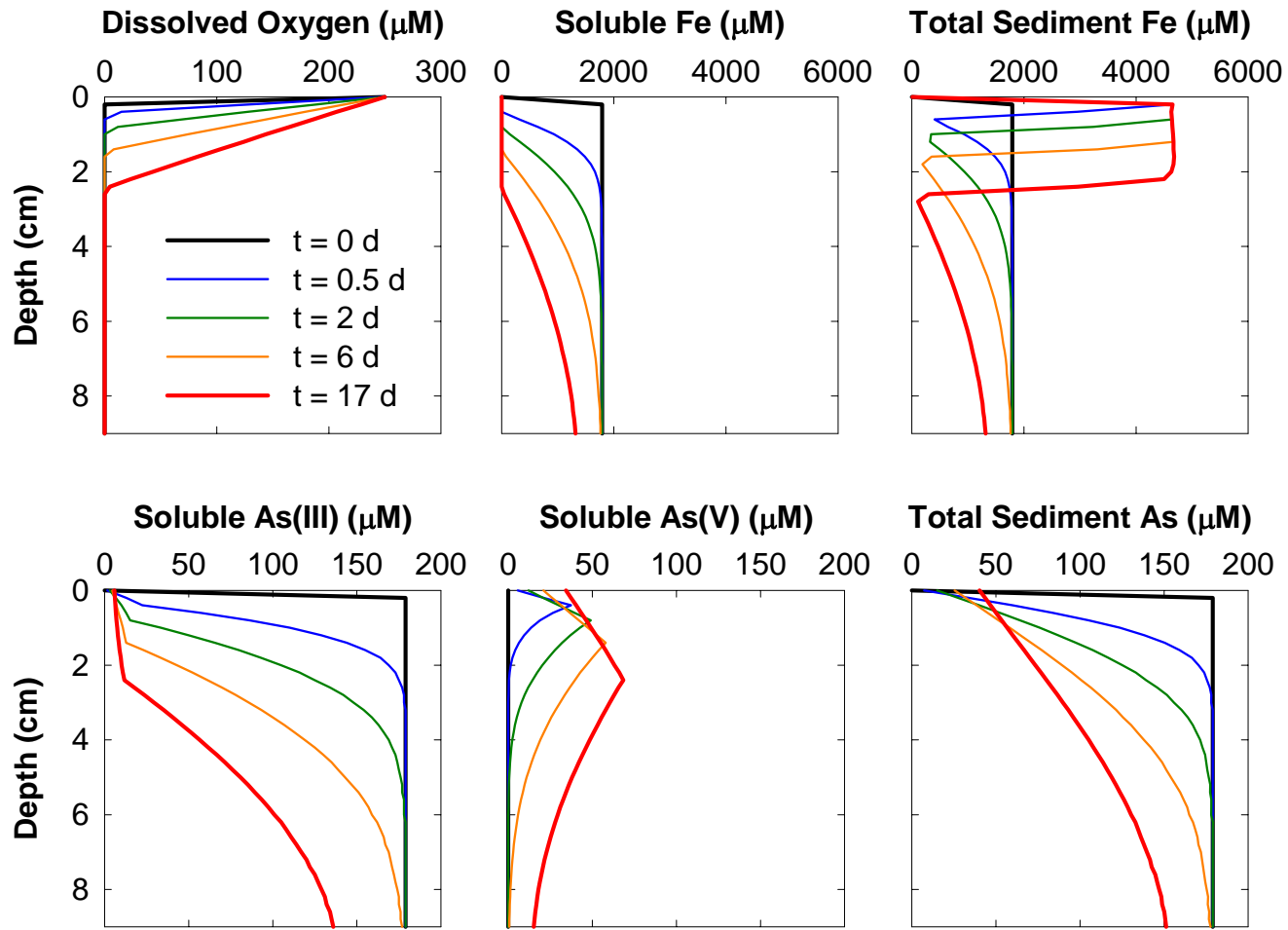
Results (I)

Column Model without Adsorption



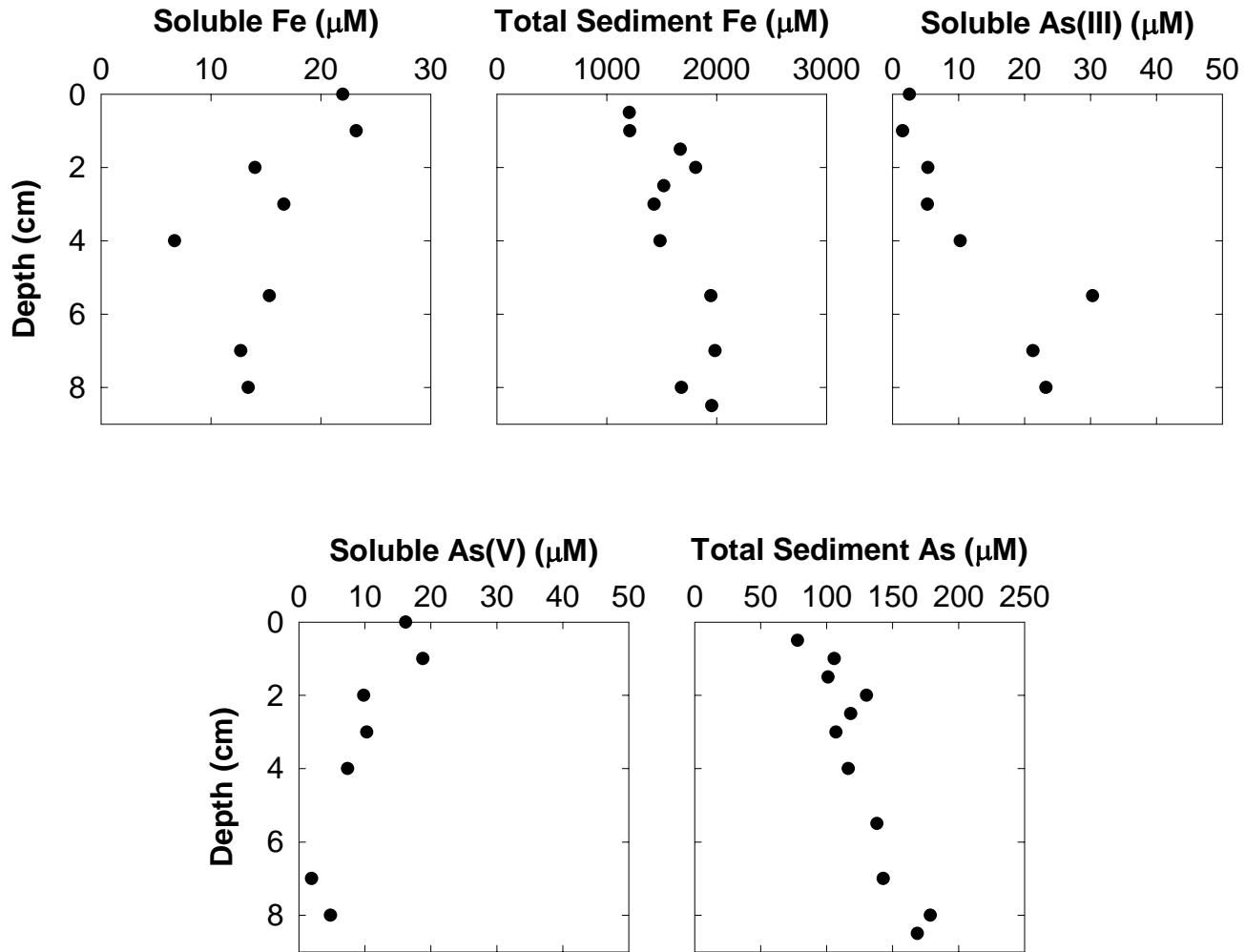
Results (I)

Column Model without Adsorption



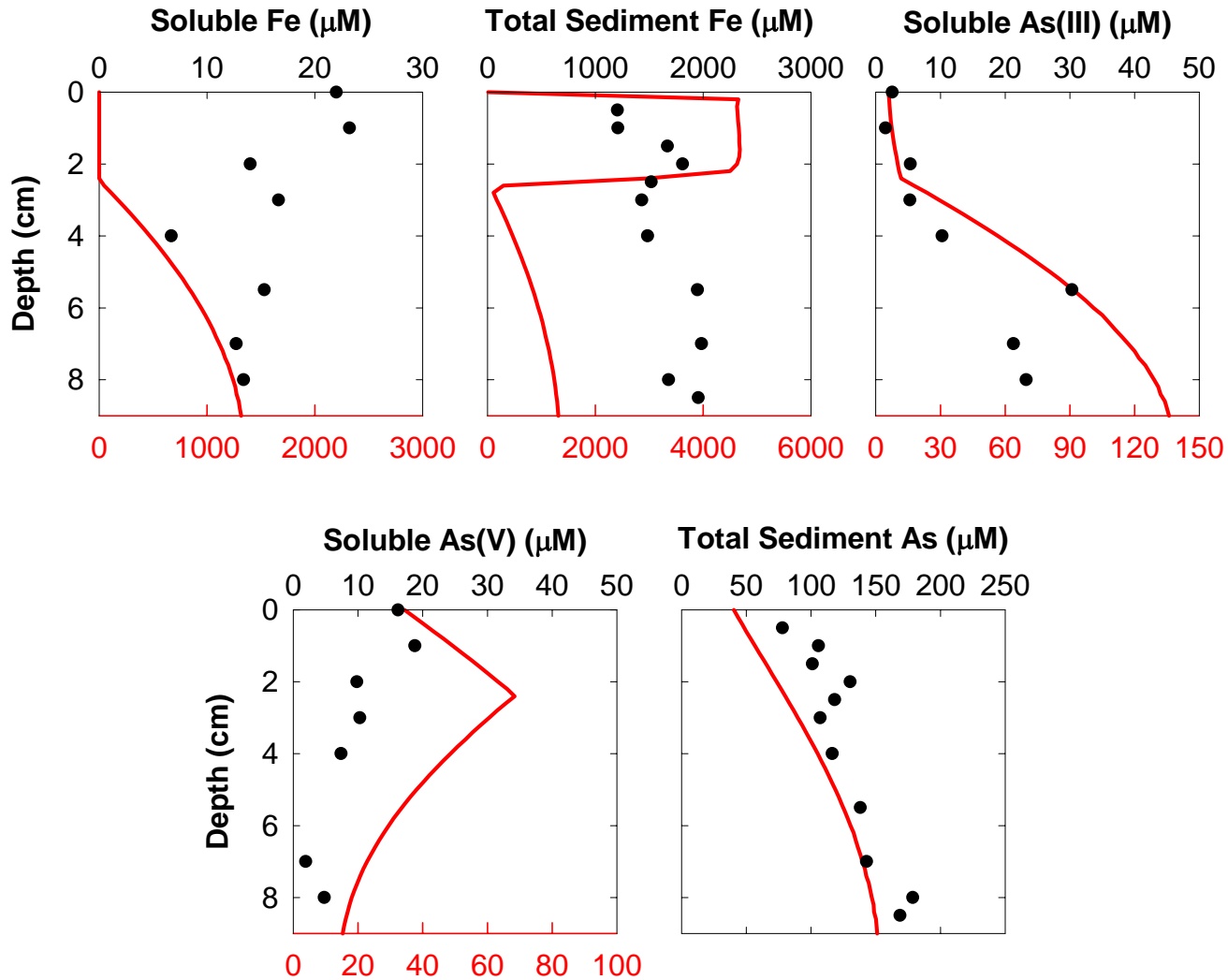
Results (II)

Experimental Column Data



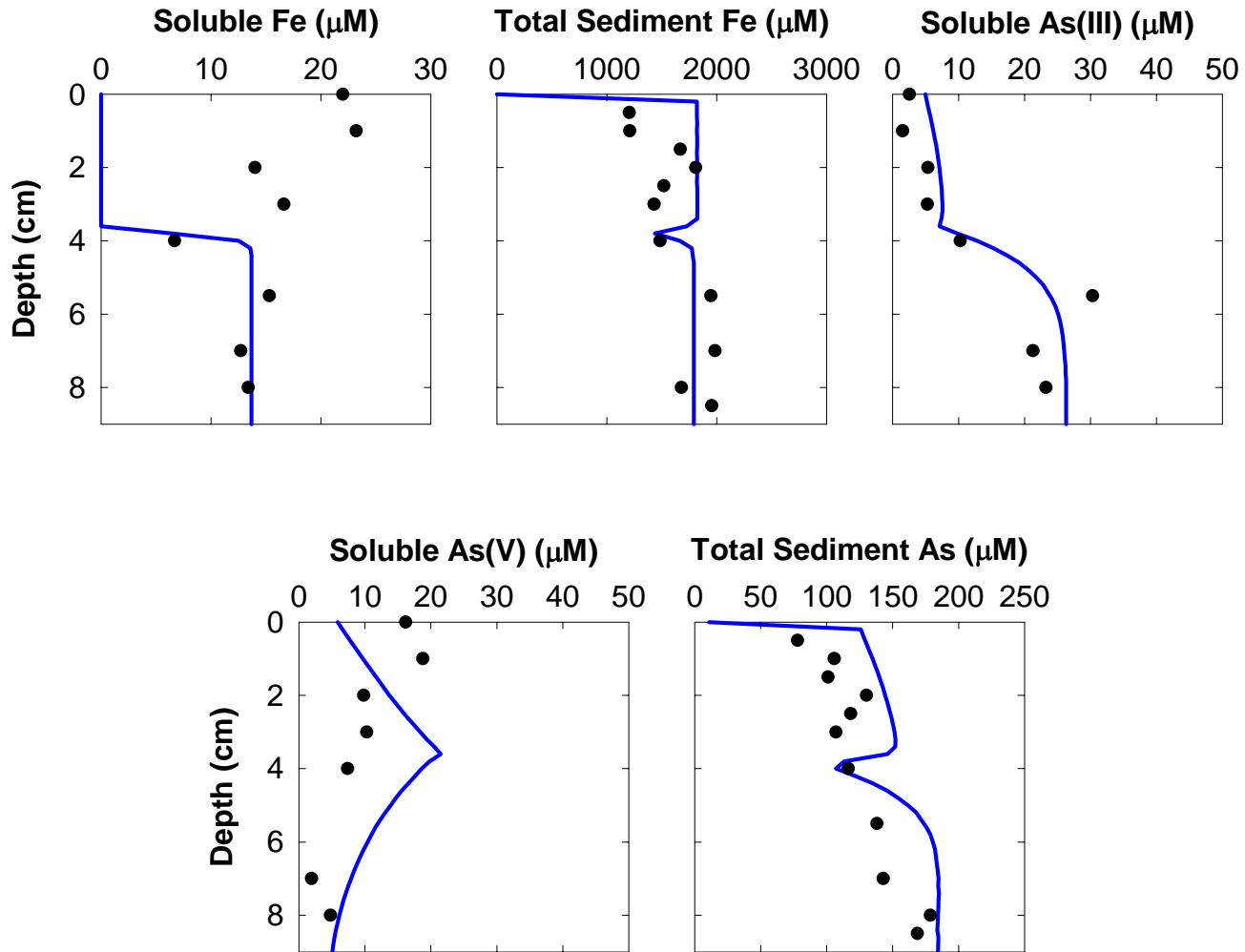
Results (II)

Experimental Column Data & Column Model without Adsorption



Results (III)

Experimental Column Data & Column Model with Adsorption





Conclusions

- Effect of transport
- Mechanism is capable of explaining As(III) oxidation in sediments
- Future work
 - Effect of pH, surface oxidation, DOM, and reduced sulfur on the mechanism.

Bisceglia, K. J.; Rader, K. J.; Carbonaro, R. F.; Farley, K. J.; Mahony, J. D.; Di Toro, D. M. Iron(II)-Catalyzed Oxidation of Arsenic(III) in a Sediment Column. *Environ. Sci. Technol.* **2005**, *39*, 9217-9222.