**Anaerobic Biotransformation and Mobility of Pu and Pu-EDTA**

H. Bolton Jr., D. Rai and L. Xun*

1 Pacific Northwest National Laboratory, Richland WA and 2 Washington State University, Pullman, WA

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**Summary**

PuO2(am) is highly insoluble but can form coordination complexes with EDTA and is the most abundant radionuclide in contaminated soils at some DOE sites. PuO2(am) is typically in the highly insoluble Pu(IV) form and is the Pu oxidation state most likely to affect groundwater transport. In the presence of Pu and EDTA, Pu(IV) complexes are less likely to be reduced to Pu(III) by reducing bacteria and PuO2(am) and Pu(IV)EDTA and answer the subsequent solubility of Pu(III)? • More likely as Pu(III)-EDTA under anaerobic conditions for EDTA degradation into EDTA degradation under anaerobic conditions. To date, no anaerobic EDTA-degrading microorganisms have been found. Pu-EDTA complexes are not stable in the absence of EDTA degradation under anaerobic conditions. Pu-EDTA is not expected to significantly mobilize Pu. Pu(IV) complexes are not stable in the absence of EDTA degradation under anaerobic conditions. Pu-EDTA is not expected to significantly mobilize Pu.

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**References**


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**Microbial Reduction of Pu(V) and Pu(IV) in PuO2(am) + EDTA Systems**

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**Fe(III) Systems**

**Pu(V) Systems**

**Mixed Systems: Pu and Fe(III), Pu and Ca**

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**CONCLUSIONS**

- Fe(III) and Ca2+ strongly compete with Pu(IV) for EDTA binding sites.
- Pu(IV) complexes are not stable in the presence of Fe(III).
- EDTA is not expected to significantly mobilize Pu(OH)2EDTA under anaerobic conditions.
- EDTA is responsible for mobilizing Pu, it is more likely as Pu(III)EDTA under anaerobic conditions.
- Work has begun on microbial reduction of Pu(III) and Pu(IV)EDTA.
- Enrichments for anaerobic EDTA degraders have been started.

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**An aerobic degradation of EDTA**

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**Biotransformation of EDTA**

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**Reductive Dissolution of PuO2(am): The Effect of Fe(II) and Hydroquinone, NIST Standard Reference Database 46**

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**References**