特別セミナー

粘土表面の放射性セシウムの吸着特性とその挙動

The sorption and transport behaviors of radioactive Cs ion on clay minerals

2011年5月30日（月）
15:00-16:30

東京大学大学院農学生命科学研究科
フードサイエンス棟 中島董一郎記念ホール
（東京都文京区弥生1-1-1）http://www.a.u-tokyo.ac.jp/nakashima/

参加無料:
事前申込不要
講演言語:
英語（通訳なし）

趣旨：東日本大震災に伴う福島原発事故では放射性セシウムで汚染された土壌の修復が急務の解決課題です。この課題を考える上で重要なのは、2μm 以下と定義される粘土粒子とセシウムの吸着・脱着特性、およびセシウムを吸着した粘土の移動です。本セミナーは、粘土表面科学の権威である Cliff Johnston 教授（アメリカパデュー大学；元アメリカ粘土学会長）の来日にあわせて開催する特別セミナーです。この問題に関心のある方の参加を歓迎します。（呼びかけ責任者：溝口勝＠農学国際専攻）

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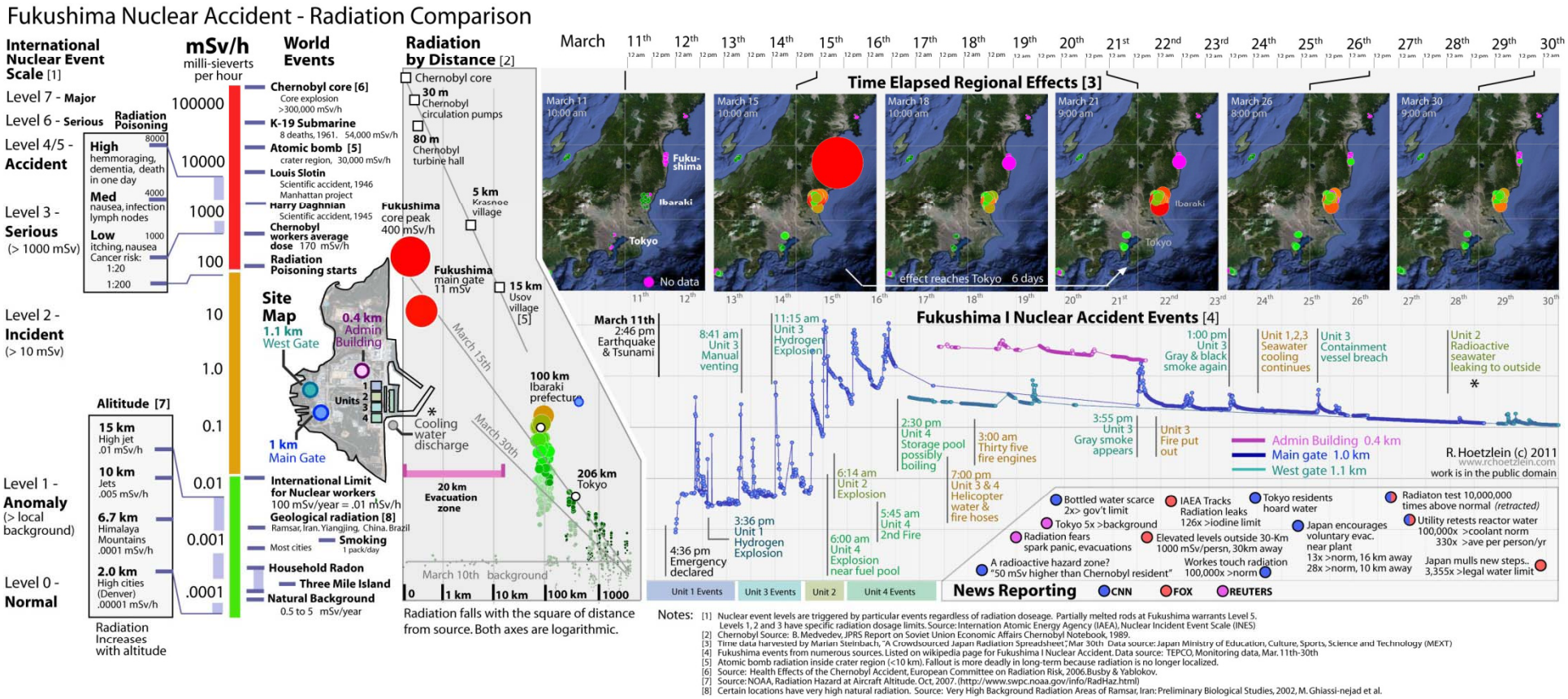

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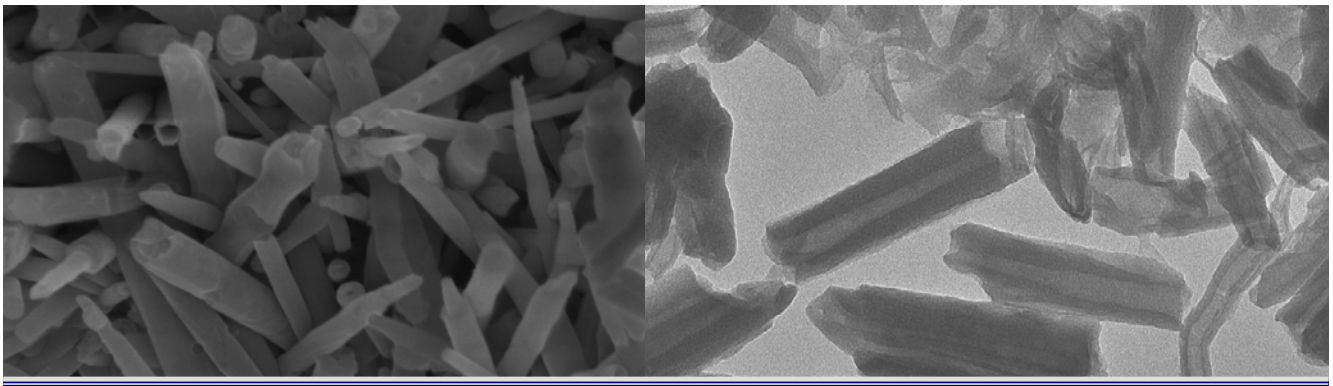

Role of clay minerals in controlling the fate and transport of radioactive Cs in soils

30 May 2011
University of Tokyo

Cliff T. Johnston[1] & Stephen F. Agnew[2]
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[2]*Columbia Energy & Environmental Services*

PURDUE UNIVERSITY

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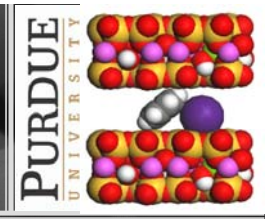
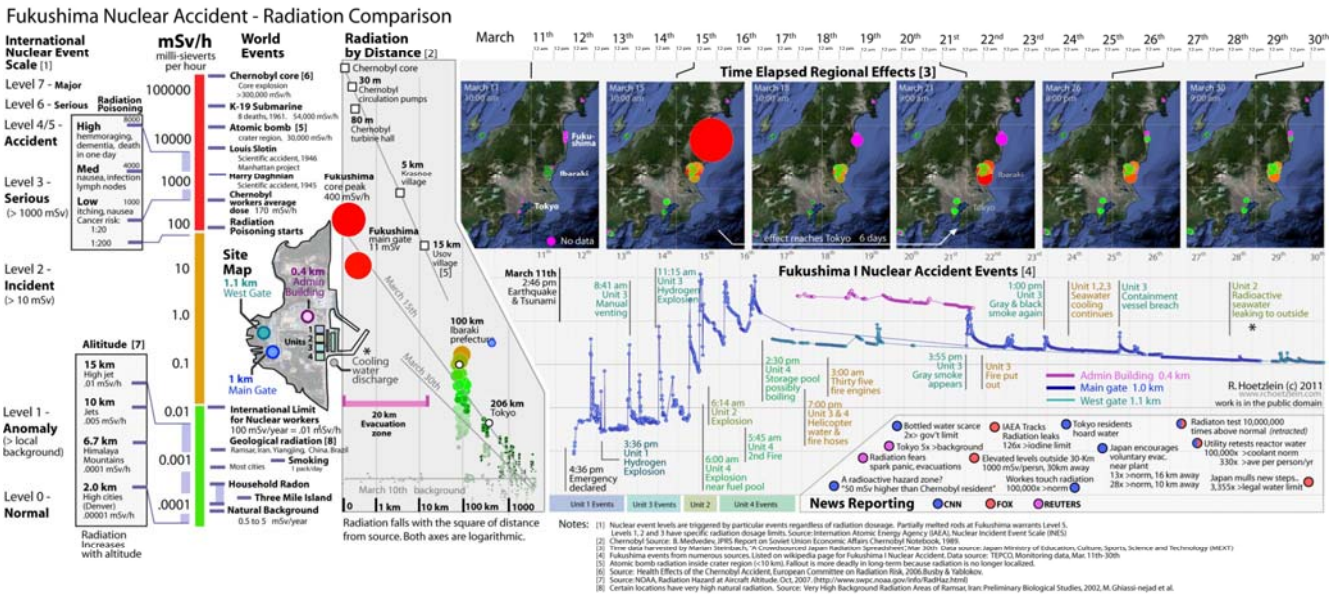
Overview



- Fukishima accident
- Movement of Cs-137 in soils
- Behavior of ^{137}Cs in soils
- Molecular Interactions of Cs with clay minerals

Fukishima Accident

- Largest recorded earthquake in Japanese history (force of 9.0 Richters).
- Largest Tsunami in Japan's recorded history, 30 ft high, struck that same northeastern shore.
- That cooling failure resulted in the release of a large amount of radiation into the air, ocean, and groundwater.
- Huge cleanup and reconstruction effort now underway



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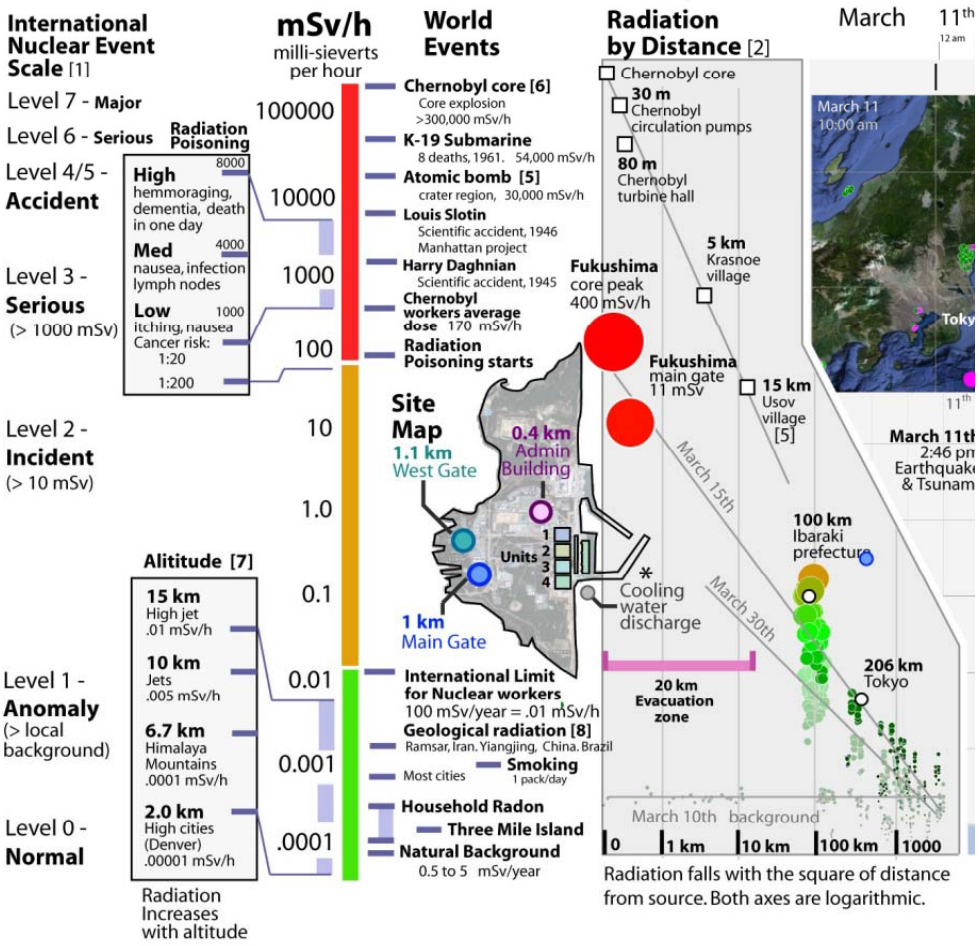


Characterization of Vadose Zone Sediment: Borehole 41-09-39 in the S-SX Waste Management Area

R. J. Serne, G. V. Last, H. T. Schaef, D. C. Lanigan, C. W. Lindenmeier, C. C. Ainsworth, R. E. Clayton, V. L. LeGore, M. J. O'Hara, C. F. Brown, R. D. Orr, I. V. Kutnyakov, T. C. Wilson, K. B. Wagnon, B. A. Williams, D. S. Burke

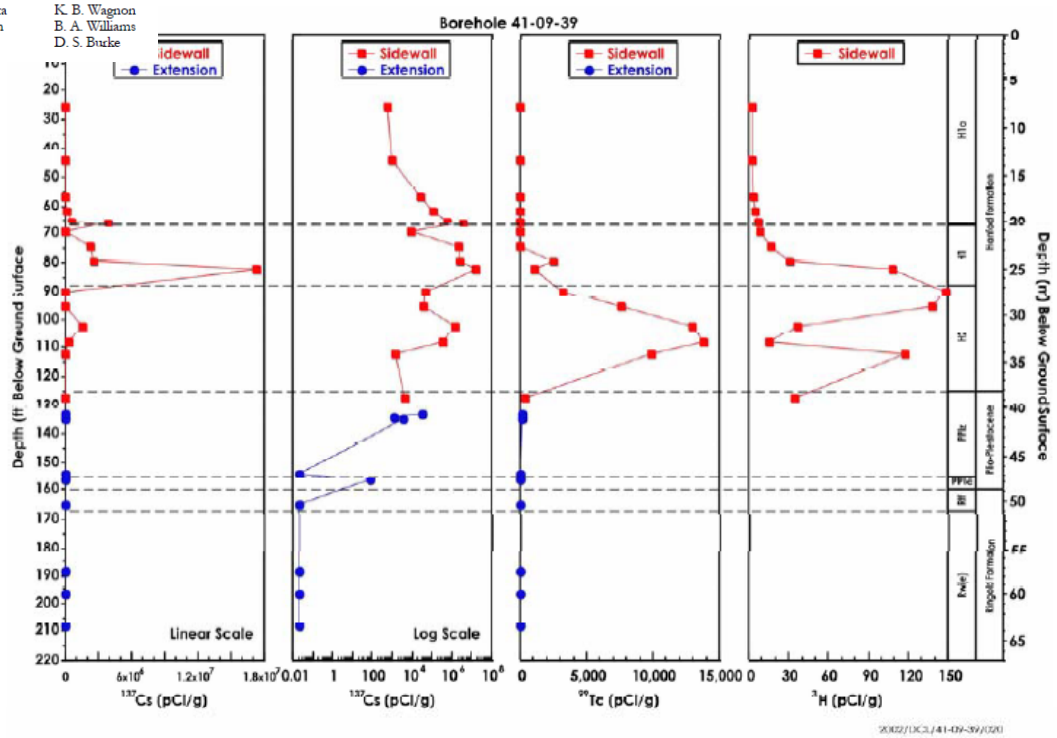
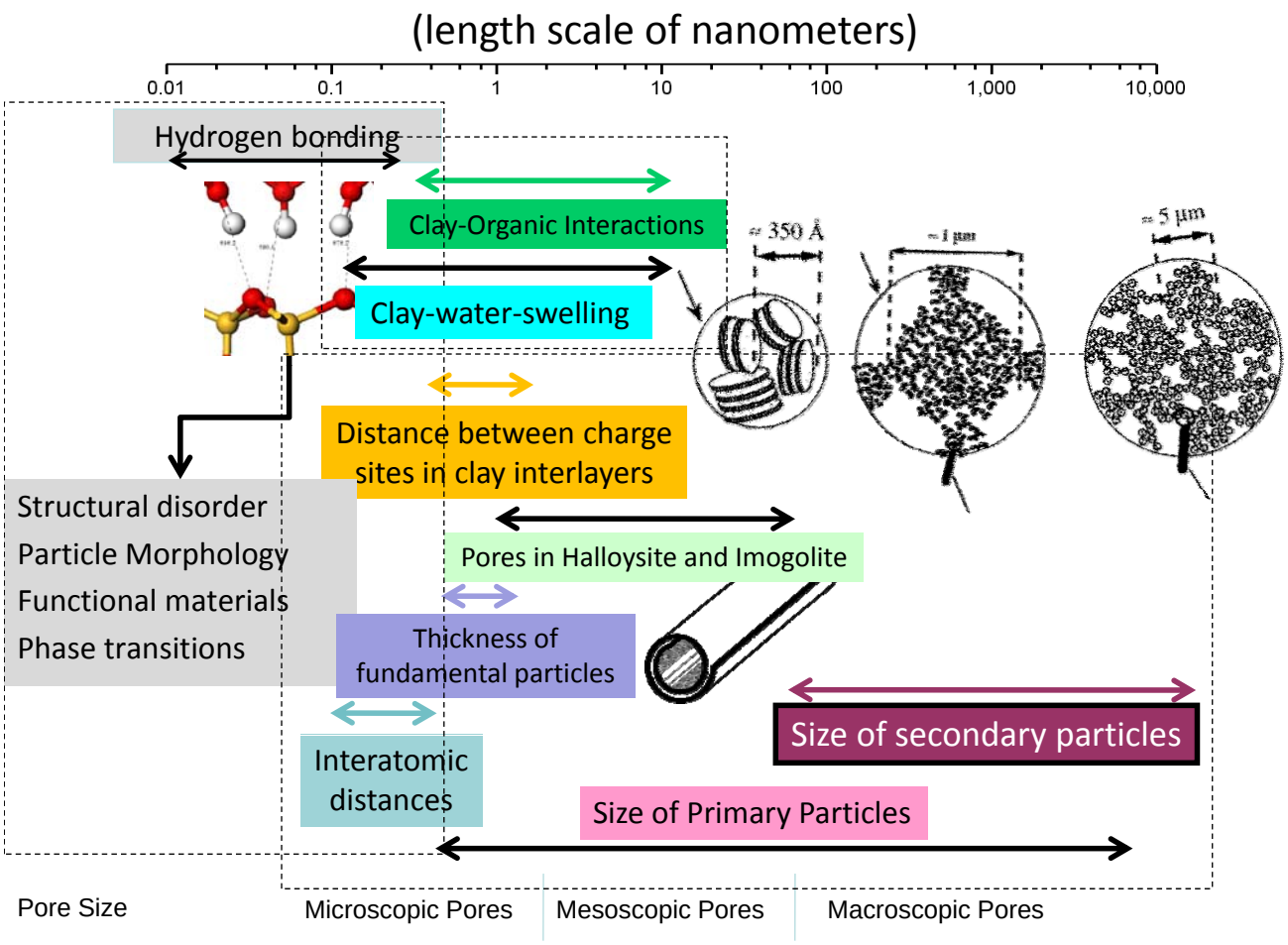
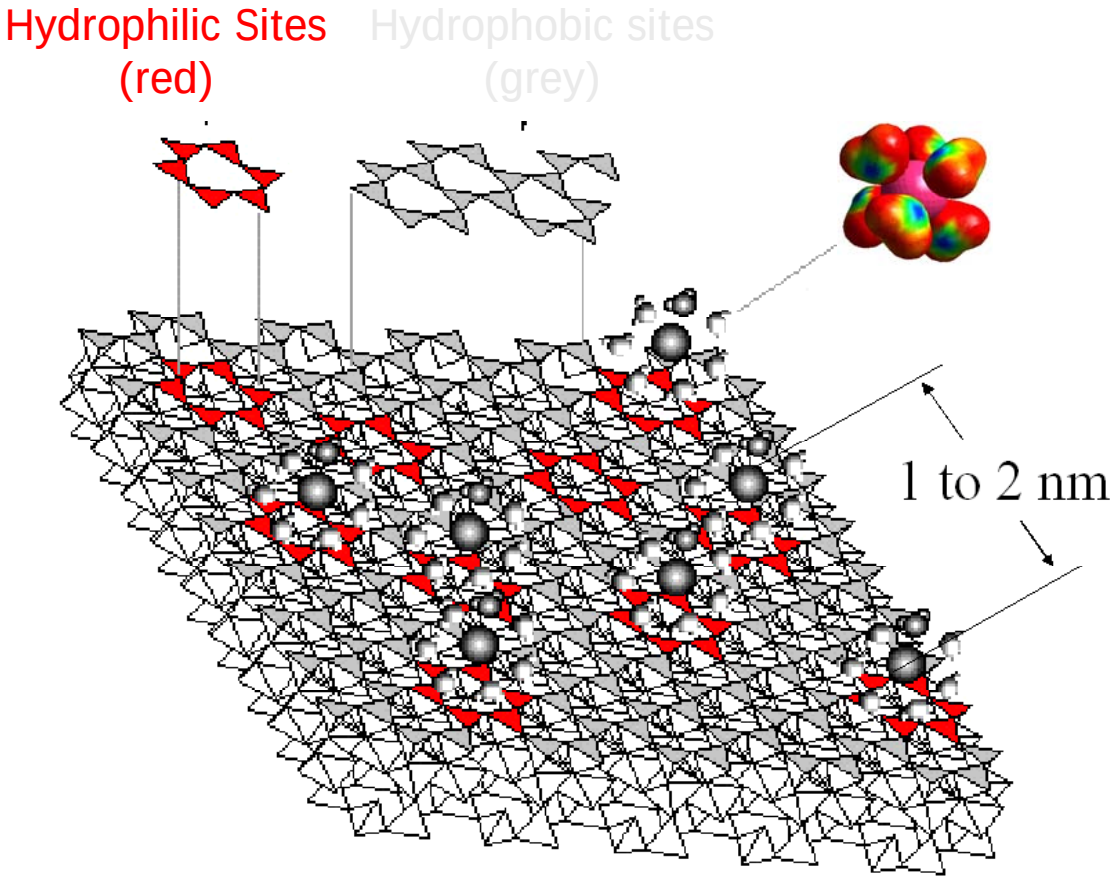
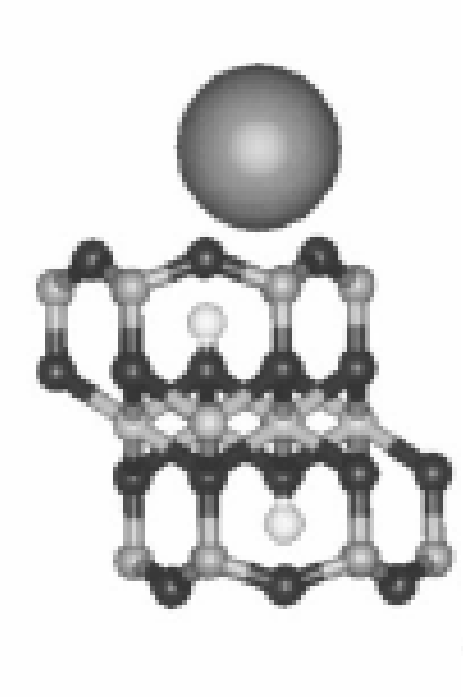
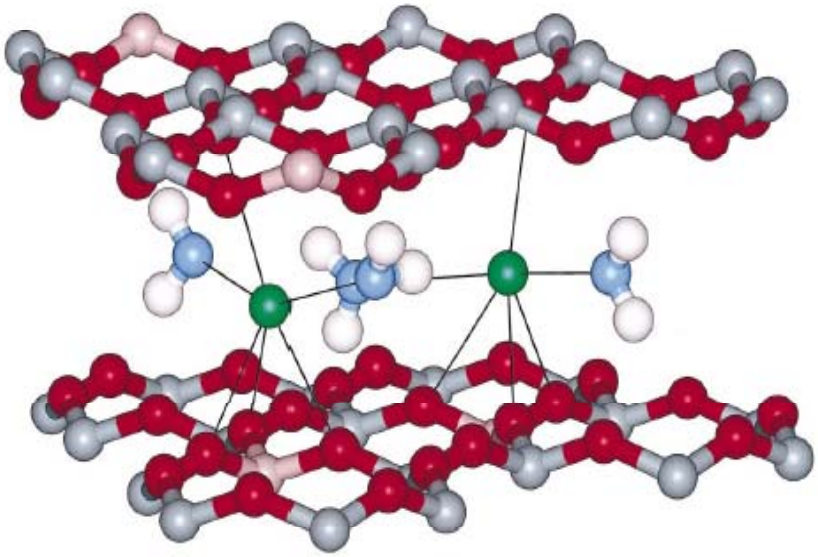


Figure 5.3. Cesium-137, Technetium-99, Strontium-90, and Tritium in Sediments from Table 5.11 Versus Depth with Geology Breaks


(length scale of nanometers)
0.01
0.1
1
10
100
1,000
10,000
Hydrogen bonding
Clay-Organic Interactions
Clay-water-swelling
≈ 350 Å
≈ 1 μm
≈ 5 μm
Distance between charge sites in clay interlayers
Structural disorder
Particle Morphology
Functional materials
Phase transitions
Pores in Halloysite and Imogolite
Thickness of fundamental particles
Size of secondary particles
Interatomic distances
Size of Primary Particles
Pore Size
Microscopic Pores
Mesoscopic Pores
Macroscopic Pores


Hydrophilic Sites (red)
Hydrophobic sites (grey)
1 to 2 nm





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