

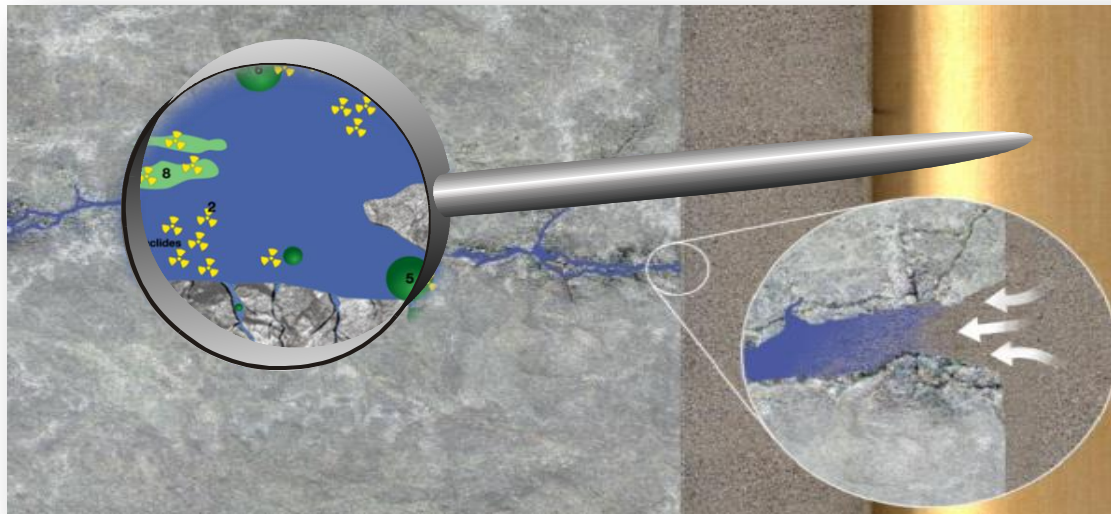
## WP 3: Colloid radionuclide & host rock interaction

Thorsten Schäfer (KIT-INE)

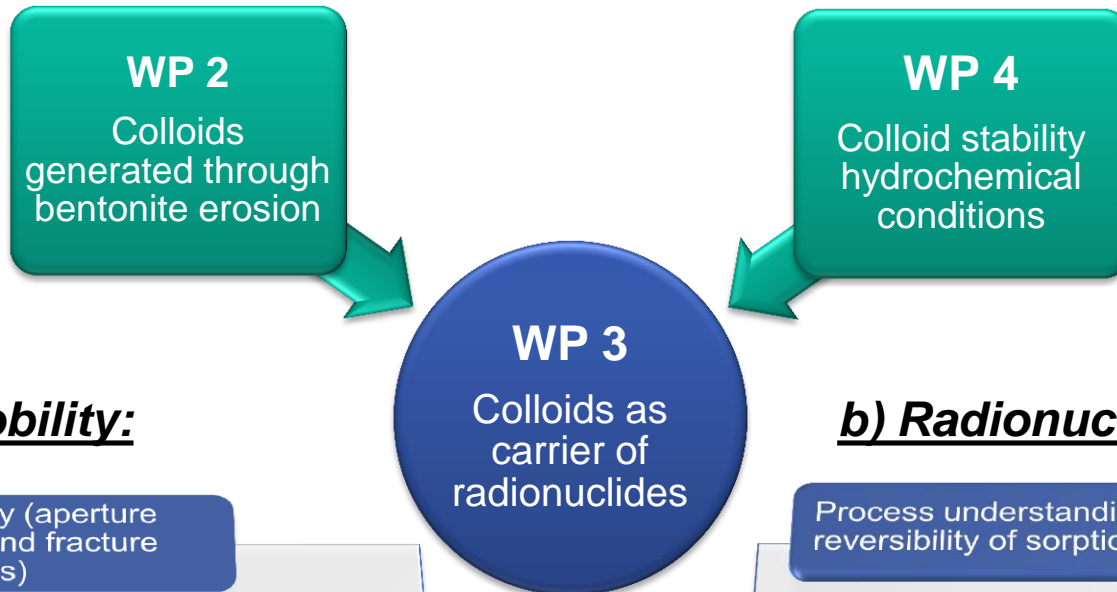
Last progress meeting 11. September 2013 (Brighton)



Institute für Nukleare Entsorgung (INE)



## ■ Work package 3: Objectives



### a) Colloid mobility:

Fracture geometry (aperture size distribution and fracture surface roughness)

Chemical heterogeneity induced by the different mineral phases

Chemistry of the matrix porewater

### b) Radionuclide interaction:

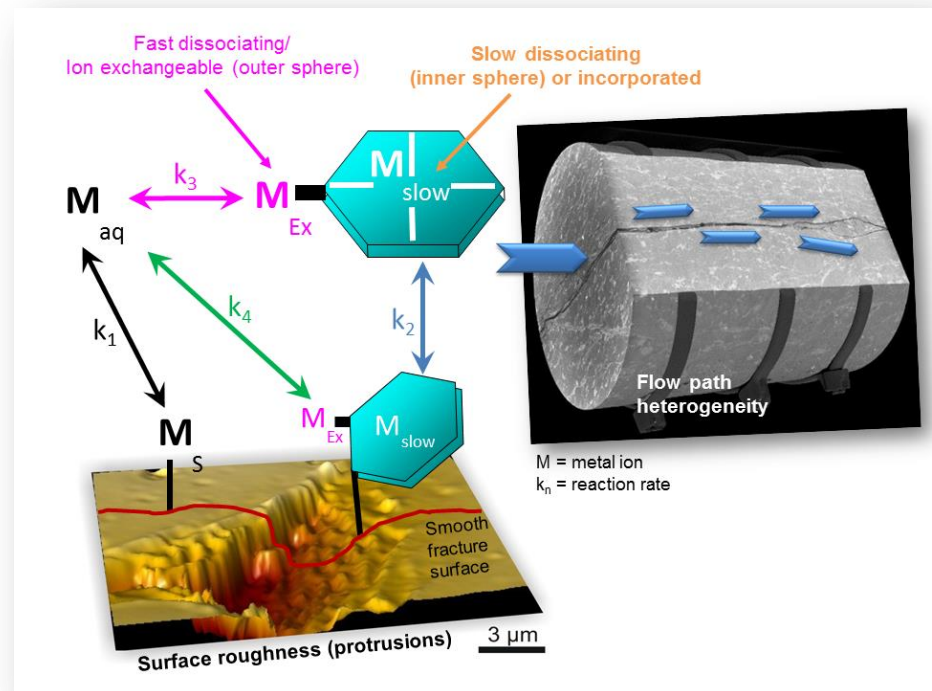
Process understanding of reversibility of sorption

Implementation in thermodynamic models

Identifying additional retention processes => matrix diffusion

# Key questions

1. What are the colloid mobility controlling processes and can we describe them appropriate?
2. Is the sorption of strongly sorbing radionuclides fully reversible, why do we observe kinetics?
3. Have we indications for additional retention processes occurring?



■ **Work package 3: Partners & PM's**

**10 Partners, 6 partners are „producing data“**

<b>Work package number</b>	3		<b>Start date or starting event:</b>			<b>Project Month 1</b>				
<b>Colloid radionuclide &amp; host rock interaction</b>										
<b>Activity Type</b>	<b>RTD</b>									
<b>Participant</b>	<b>CIEMAT</b>	<b>UNIMANCH</b>	<b>KIT-INE</b>	<b>NRI-REZ</b>	<b>MSU</b>	<b>SKB</b>	<b>ClayTech</b>	<b>NDA-RWMD</b>	<b>HU</b>	<b>KTH</b>
<b>Person-months for the participant</b>	11	39	13	10	8	1	1	1	12	1

**Partners ClayTech, SKB/KTH & NDA-RWMD** participate on WP 3 meetings and in prep. of the final synthesis report through discussions or provide information of how the issue is handled in current assessment.



- **Microscale investigations** on colloid mobility controlling processes, here especially **CIEMAT, KIT, MSU and HU** are providing data.
- **Macroscale investigations** on colloid mobility in near-natural systems, here the partners **CIEMAT, KIT, NRI and HU** are involved.
- Process understanding of **radionuclide** colloid interaction with special emphasis on **sorption reversibility**; here partners **CIEMAT, KIT, UNIMANCH and HU** are contributing.
- **Mechanistical model** of RN colloid interaction; **all partners**.



## Deliverables

### Work Package 3

D3.1
D3.2
D3.3
D3.4
D3.5
D3.6
D3.7
D3.8
D3.9
D3.10
D3.11
D3.12

Community research

**BELBaR**  
 (Contract Number: 295487)

**DELIVERABLE (D-N°:3.6)**

Understanding of Radionuclide Colloid Interaction  
 (with special emphasis on sorption reversibility)

N. Bryan and N. Sherriff; University of Manchester  
 K. Norrfors, M. Bouby, Y. Heyrich, S. Heck and T. Schäfer; KIT, Karlsruhe

Reporting period: 01/03/12 – 29/02/16  
 Date of issue of this report: 30/05/14  
 Start date of project: 01/03/12      Duration: 48 Months

Author(s):  
 Start date of project: 01/03/12

Project co-funded by the European Commission under the Seventh Euratom Framework Programme for Nuclear Research & Training Activities (2007-2011)

Dissemination Level	
PU	Public

BELBaR

UNIMAN, CIEMAT, KIT, HU

KIT-INE

PU	6	
PU	15	✓
PU	15	✓
PU	15	✓
PU	27	✓
PU	27	✓
PU	27	✓
PU	39	
PU	39	
PU	39	
PU	39	
PU	39	
PU	44	





## WP 3: Colloid radionuclide & host rock interaction

- 15:00 - 15:05      Overview & current status
- 15:05 – 15:25      **Pirkko Hölltä** (HU): *“Radionuclide sorption on MX-80 bentonite colloids and colloid associated radionuclide transport”*
- 15:25 – 15:45      **Katerina Videnska** (UJV): *“Study of Sr-85 transport through a column fill with crushed granite in presence of bentonite colloids”*
- 15:45 – 16:05      **Nick Bryan** (Univ. Manchester): *“Radionuclide/Bentonite dissociation kinetics”*
- 16:05 – 16:30      Coffee/Tea**
- 16:30 – 16:50      **Thorsten Schäfer** (KIT-INE): *“New results from the CFM project & current status”*