



# R&D on Xe trapping at SCK CEN

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WOSMIP Remote

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# Experimental system

## Current features

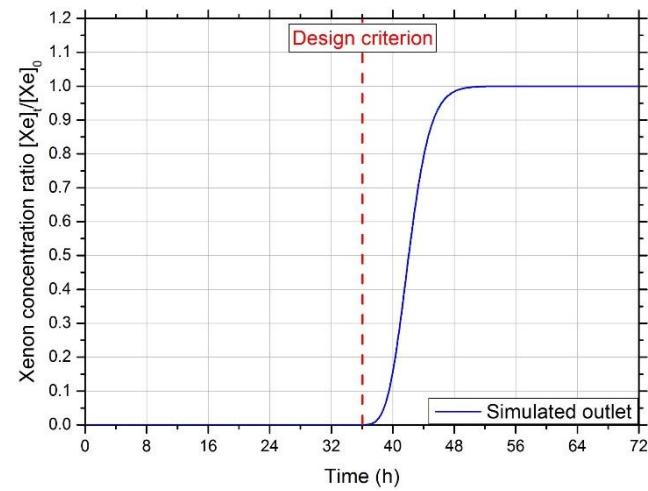
- Species: Xe, Kr or Ar
- Carrier gas:  
He, Ar, N<sub>2</sub> or Air
- Concentration range:  
100 ppb to 10 000 ppm
- Measured species:  
Xe, Ar, Kr, O<sub>2</sub>, CO<sub>2</sub>, N<sub>2</sub>, He, H<sub>2</sub>O, ...
- Temperature range adsorbent:  
-80°C to 250°C
- Flow rate: up to 1.5 L/min
- Moisture content:  
~ 0 to 90 % R.H.



# Modelling capabilities

- Simulation of the advection-diffusion-adsorption process in Comsol Multiphysics®

**Design studies**

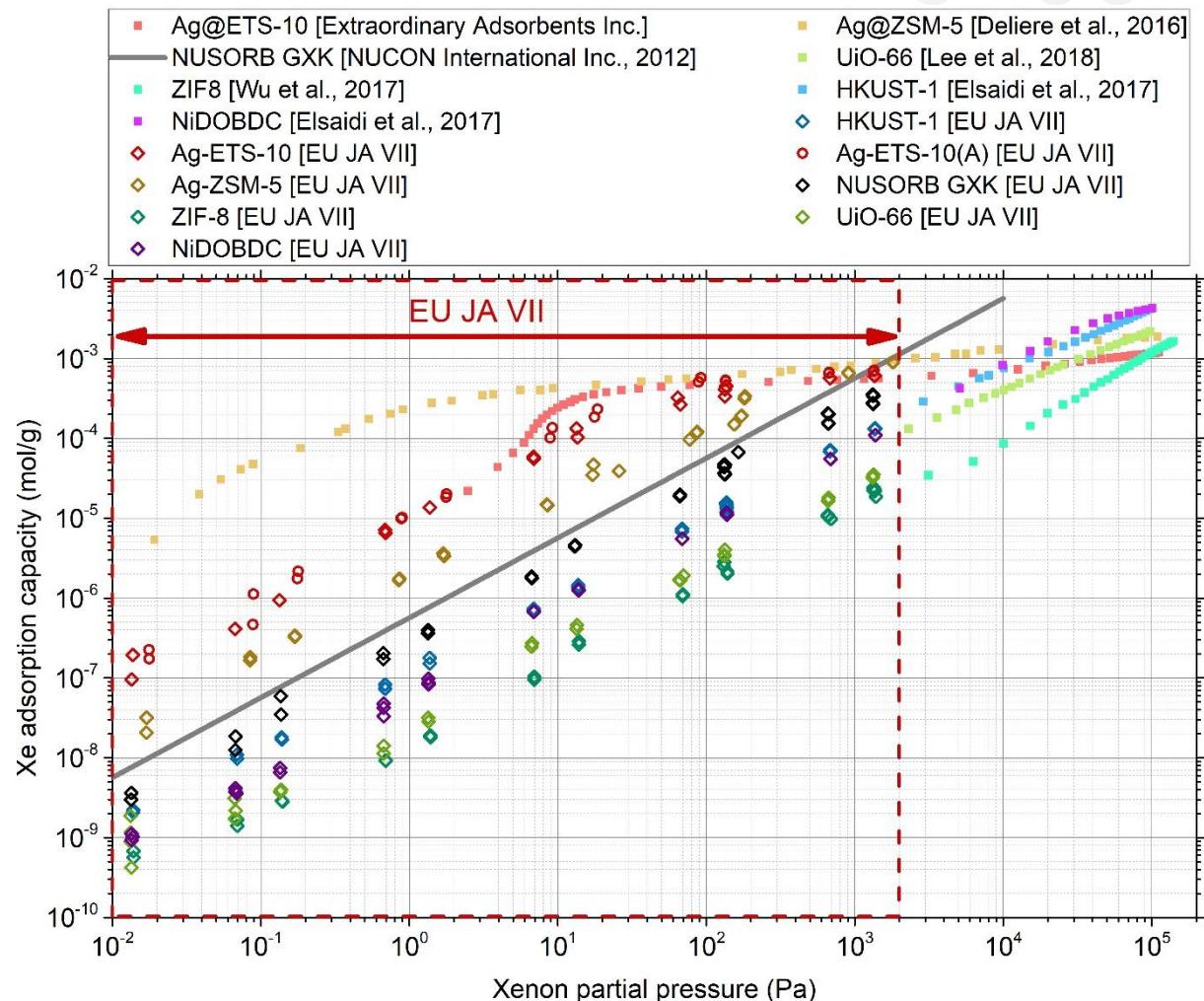


**Prototype construction**



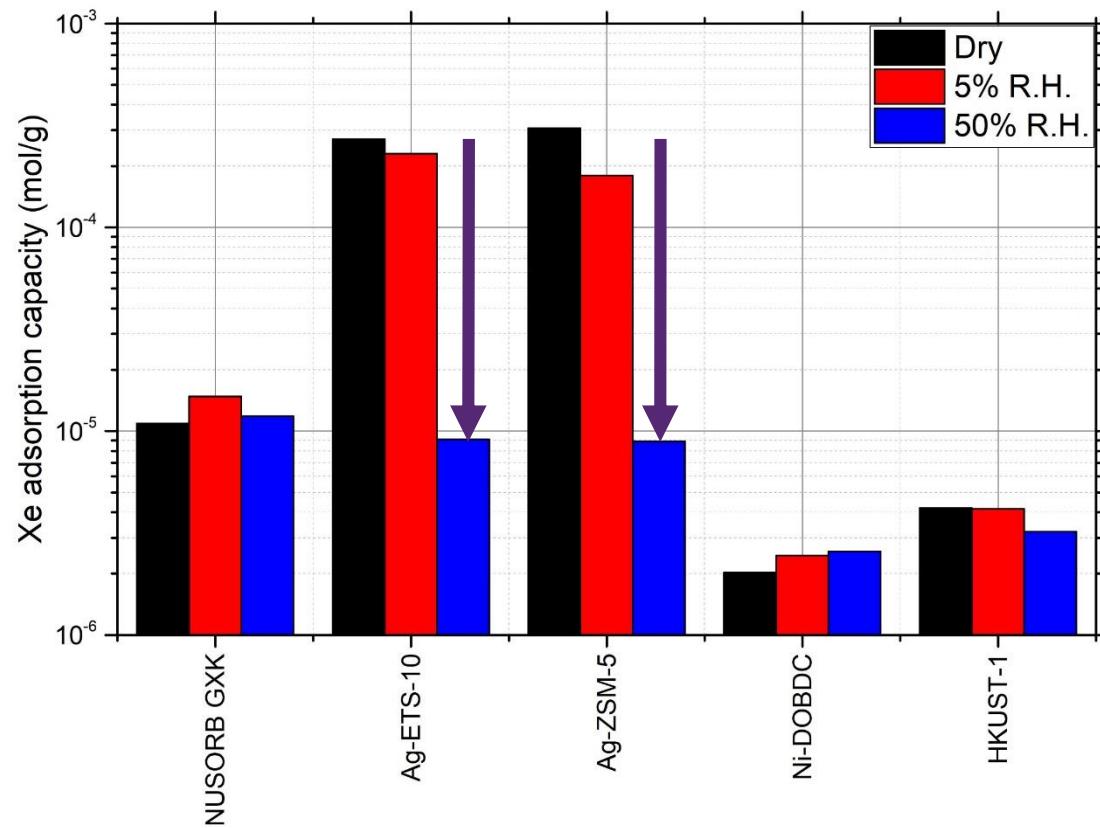
# Recent achievements (1/2)

- Xe/N<sub>2</sub> adsorption isotherm 8 materials
- Ranking at 1 ppm Xe in N<sub>2</sub>
  - Ag-ETS-10(A) ~ X 70
  - Ag-ETS-10 ~ X 20
  - Ag-ZSM-5 ~ X 3
  - NUSORB® GXK ~ 1
  - HKUST-1
  - Ni-DOBDC
  - UiO-66
  - ZIF-8



# Recent achievements (2/2)

- Effect of moisture on Xe adsorption



# References

C. Gueibe, J. Camps and K. van der Meer, "Xenon mitigation project – Phase I: adsorption materials", SCK CEN, Mol, 2014

To download: <https://publications.sckcen.be/portal/>

C. Gueibe, J. Camps, J. Rutten, K. van der Meer and J. Paridaens, "Xenon mitigation project - Phase II: adsorption materials", SCK CEN, Mol, 2015.

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C. Gueibe, J. Rutten, J. Camps and K. van der Meer, "Xenon mitigation project - Phase III: prototype construction and testing", SCK CEN, Mol, 2015

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C. Gueibe, J. Camps, J. Rutten and K. van der Meer, "Radioxenon Project – Task II/1: Preliminary Report", SCK CEN, Mol, 2017

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