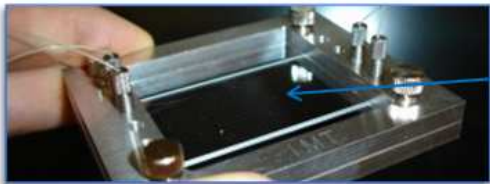
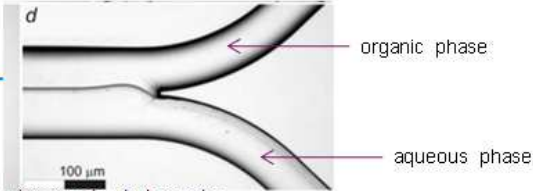
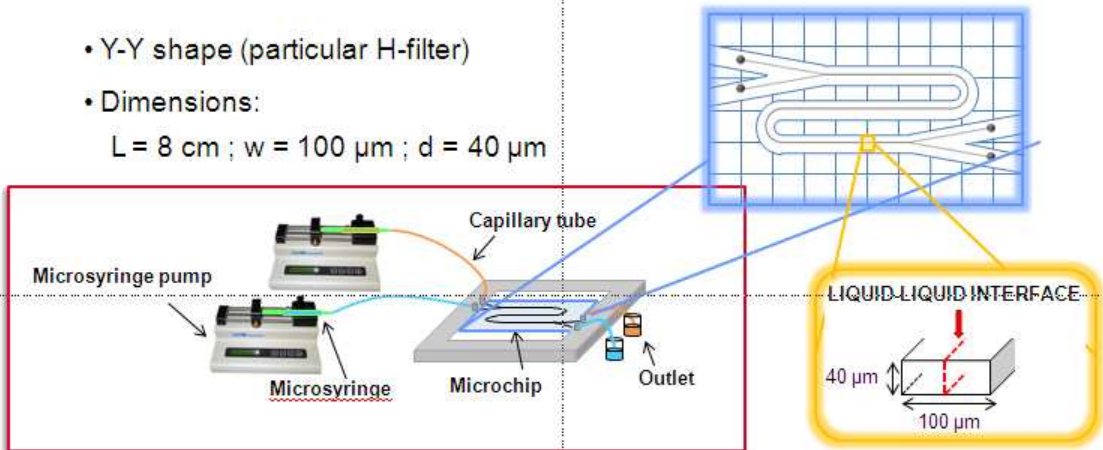


Form 2

Technology Information	
Area	Strontium immobilization and nuclide analysis in groundwater (Point 6)
Title	MICRO LIQUID-LIQUID EXTRACTION DEVICE FOR THE ANALYSE OF Sr IN GROUNDWATER
Submitted by	CEA
<p>1. Overview of Technologies</p> <p>Functions</p> <p>Separation of Sr from water using a microfluidic tool before detection.</p> <p>Summary Descriptive</p> <ol style="list-style-type: none"> Sr is separate from the interfering metals by liquid-liquid extraction in a micro-device with a specific extractant (crown ether). By coupling with a second micro-device, Sr is mixed with a scintillating liquid prior to the measurement by beta scintillation. <p>Features & Specifications</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p style="text-align: center;">Laminar flux, separated phases</p> <p style="text-align: center;">Microsystem used for liquid-liquid extraction</p> <ul style="list-style-type: none"> • Y-Y shape (particular H-filter) • Dimensions: L = 8 cm ; w = 100 μm ; d = 40 μm <div style="display: flex; justify-content: space-around; align-items: center;">  </div> <p style="text-align: center;">Experimental setup for micro liquid-liquid extraction experiment</p>	

The equipment is composed of the following parts:

- A pressure system to transport fluids,
- A microsystem designed for the extraction of strontium,
- A microsystem designed to mix the strontium with a scintillating liquid,
- A beta scintillator coupling with the microsystems.

Advantages of our Technology

- Microsystems allow to reduce both the volumes of the samples and of the solvents (μL instead of mL),
- Microsystems allow to reduce the analysis time and the operators' exposure time thanks automation and parallelization of the analyses,
- Separation/purification steps can be coupled to the detection system,
- High efficiency extraction of Sr.

Disposable analytical micro-device, can be produced at a large scale

2. Notes

Technology readiness level

The microfluidic technology, the measurement equipments, and software equipments are already available in the biologic range (numerous commercial solutions are available) but it is not already the case for the nuclear range. Solutions studied for radiochemistry are at development stage but the first results are very promising.

Challenges

- Design and fabrication of the microsystems.
- Extraction process optimization
- Coupling with detection

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