Radon diffusion in plastic bag

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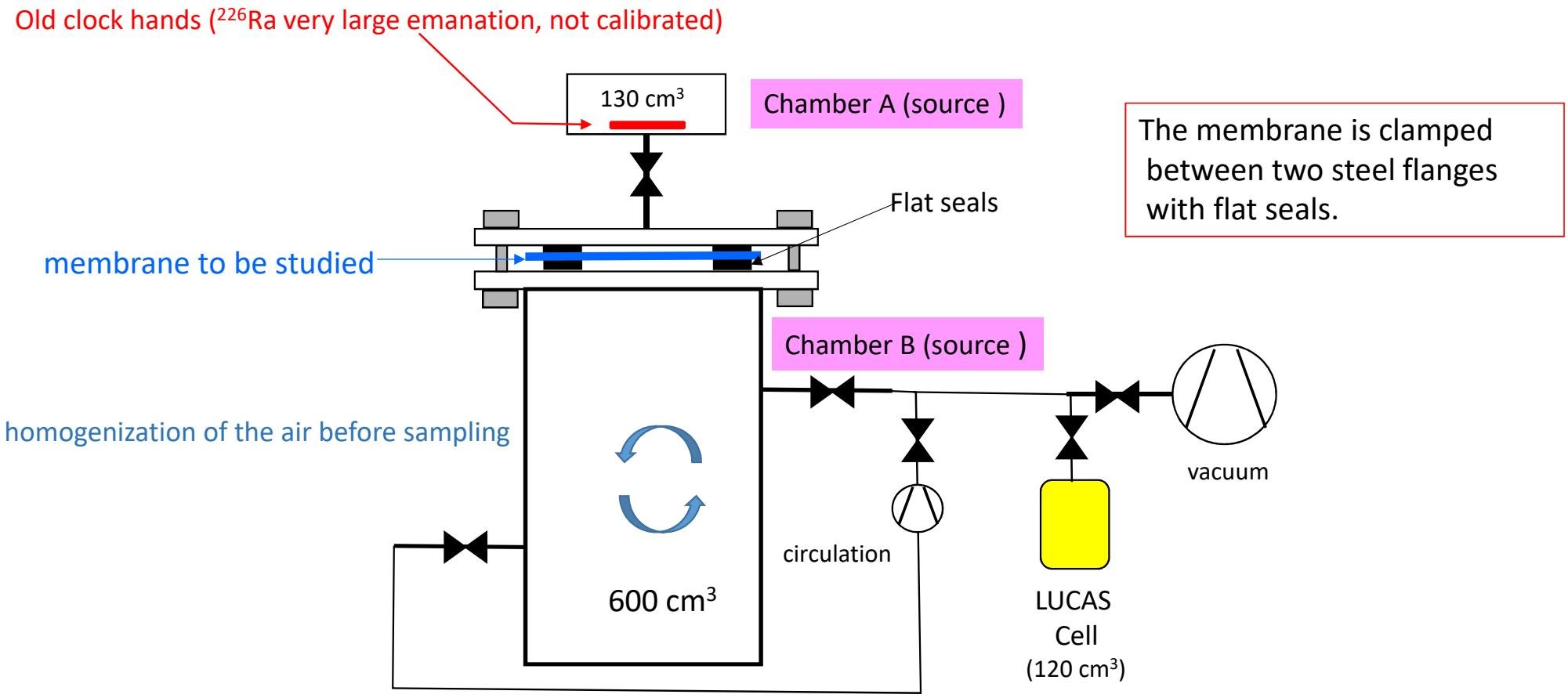
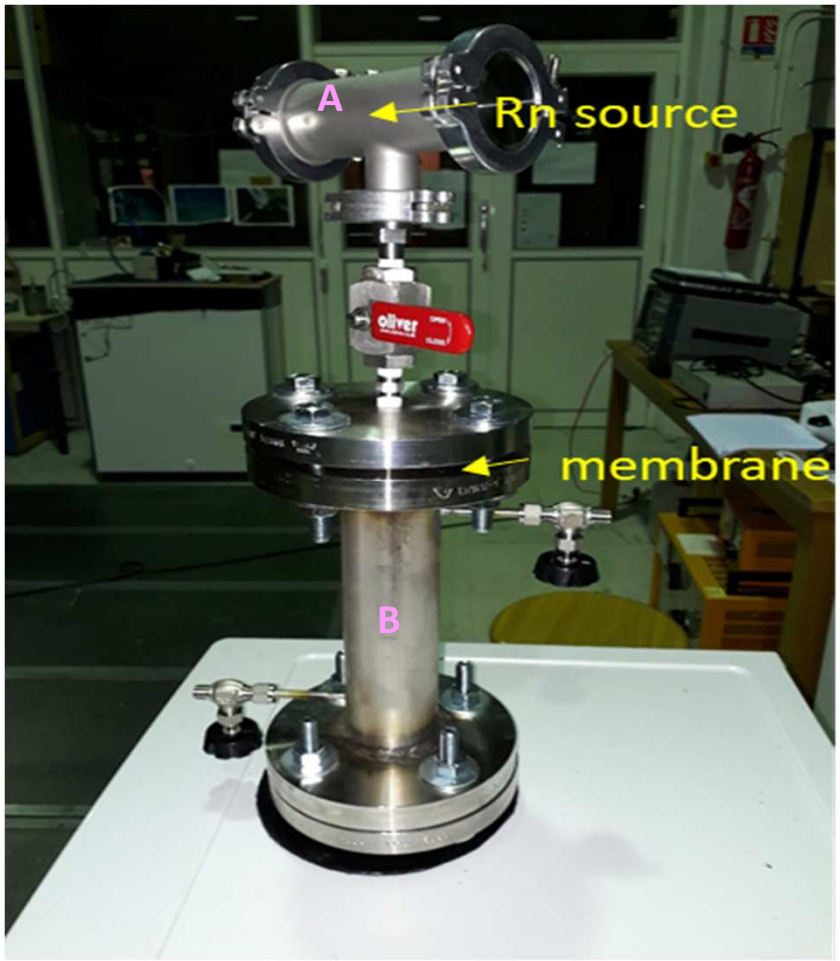
We made a new radon diffusion setup to measure the radon diffusion in one sheet of plastic bag.



The membrane is clamped between two steel flanges with flat seals.

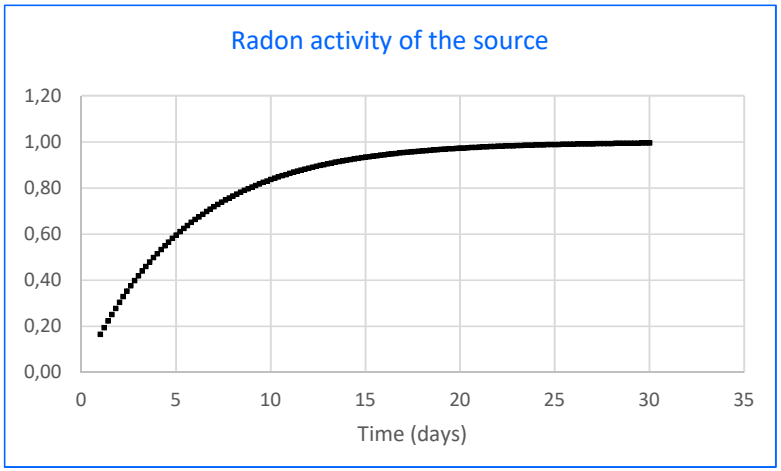


Single sheet

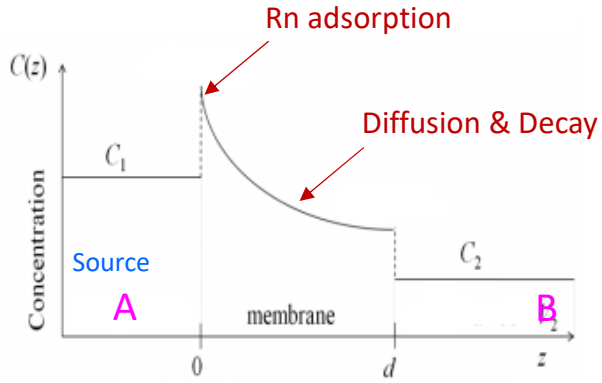
Diameter : 10 cm
Thickness : 85 µm

Remarks

- Radon source activity: unknown at the beginning (not calibrated)
- Measurement when the activity of the Rn source is stabilized



- Radon évolution in the membrane

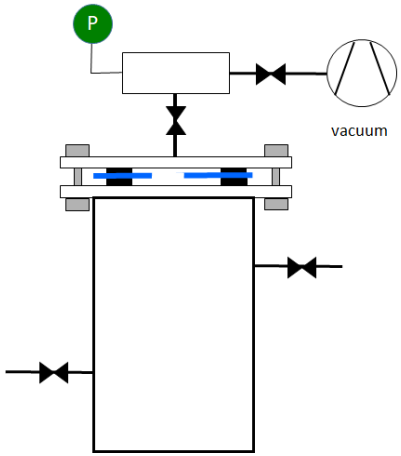


- Measurement in chamber B
  7 days after Rn stabilization in A

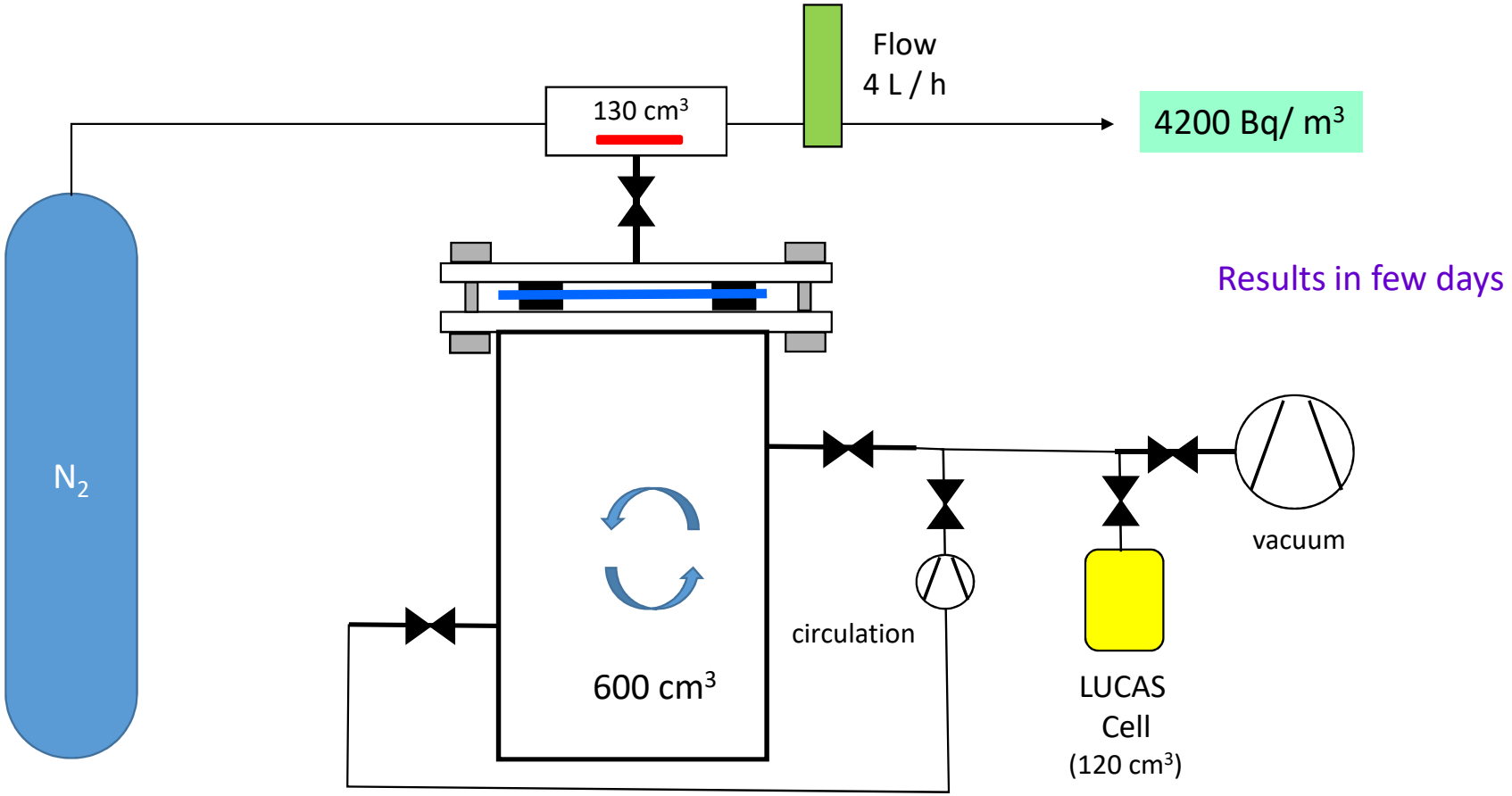
Measurement

- Single sheet plastic bag (-> membrane)
- LUCAS Cell (Rn detector) background : 30 Bq/m^3
- Radon around the chamber : 30 Bq/m^3
- Rn in the chamber B with membrane (30 days) : 300 kBq/m^3
- Rn in the chamber B without membrane : 474 kBq/m^3
- Transparency : 63 % !!!
- Direct measurement

✓ Leakage rate (primary vacuum) with perforated membrane < 3 mbar/day



New measurement with weaker Rn source intensity



Future

- New measurement of single sheet plastic bag with weaker source
- Measurement Rn diffusion in acrylic plate

→ Radon diffusion coefficient measurement

→ *Needs a sample plate of ~ 15 cm x 15 cm.*