5A type molecular sieve vs activate carbon

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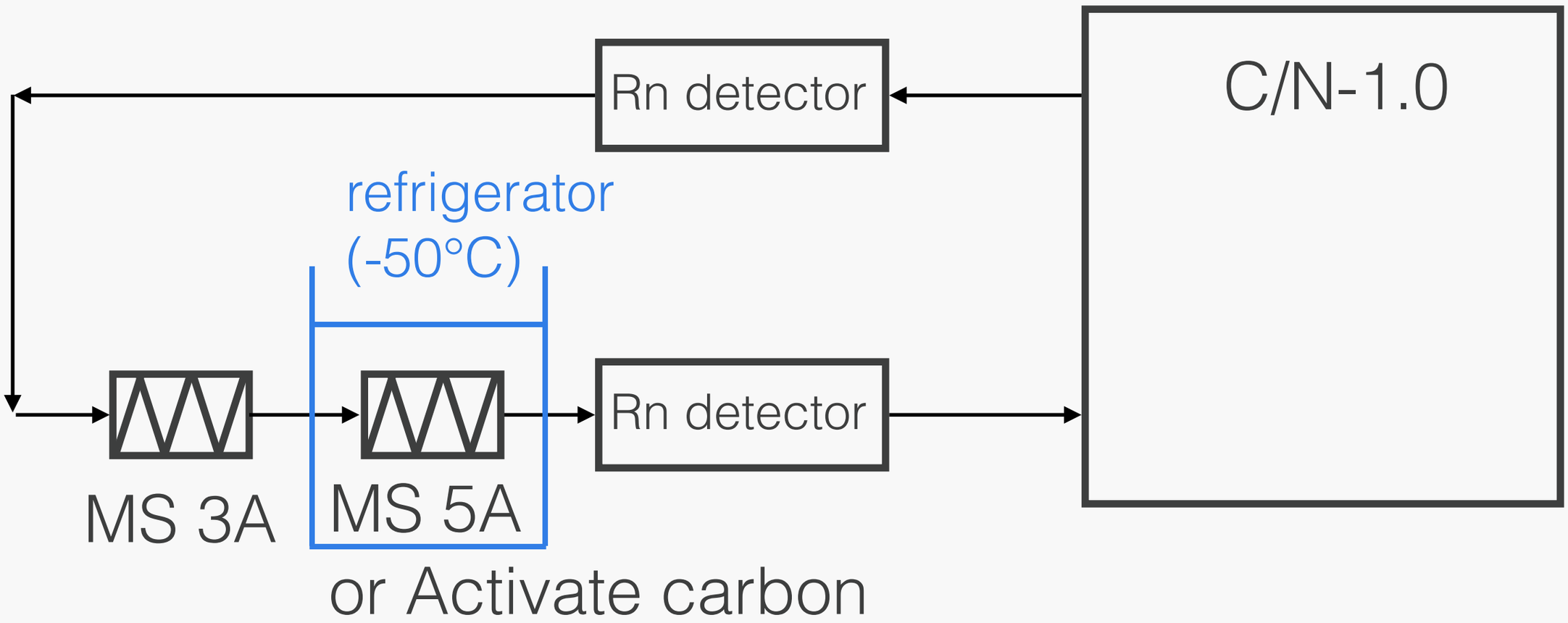
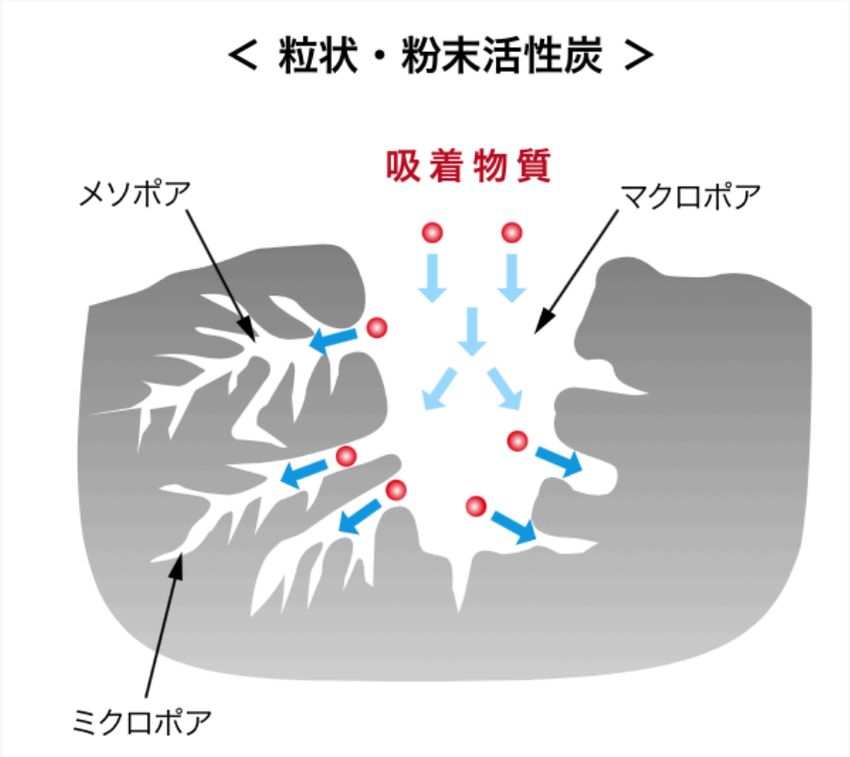
Filtering system



or Activate carbon



MS 3A：for water capture

MS 5A: for Rn capture

Fil

refrigera
(-50°C)

MS 3A

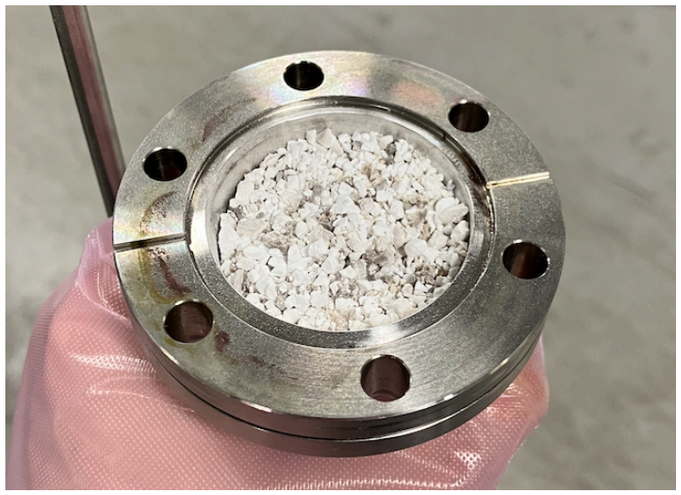
MS 5A

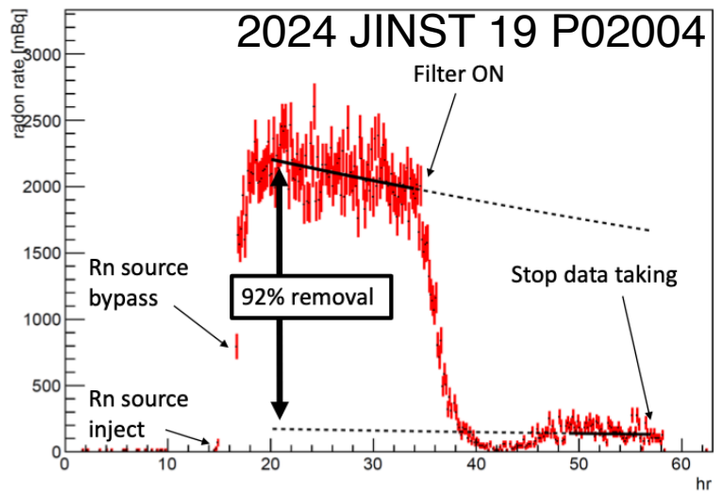
or Activate carbon

MS 3A：for water capture

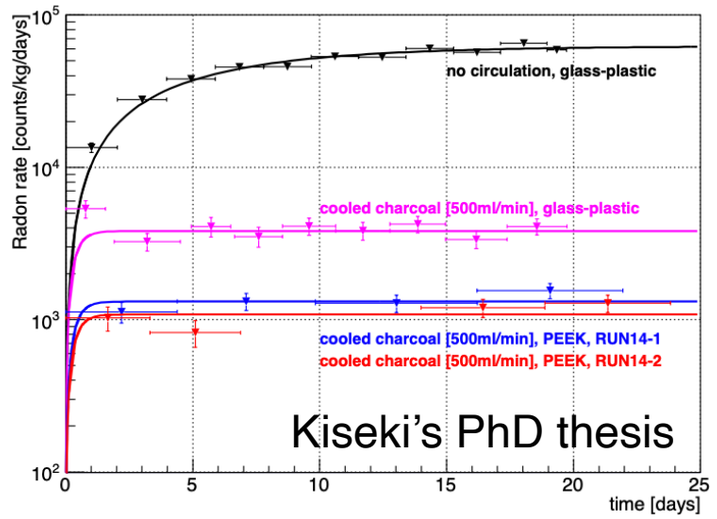
MS 5A: for Rn capture

Low-BG MS (Zeolite) provided by Hiroshi

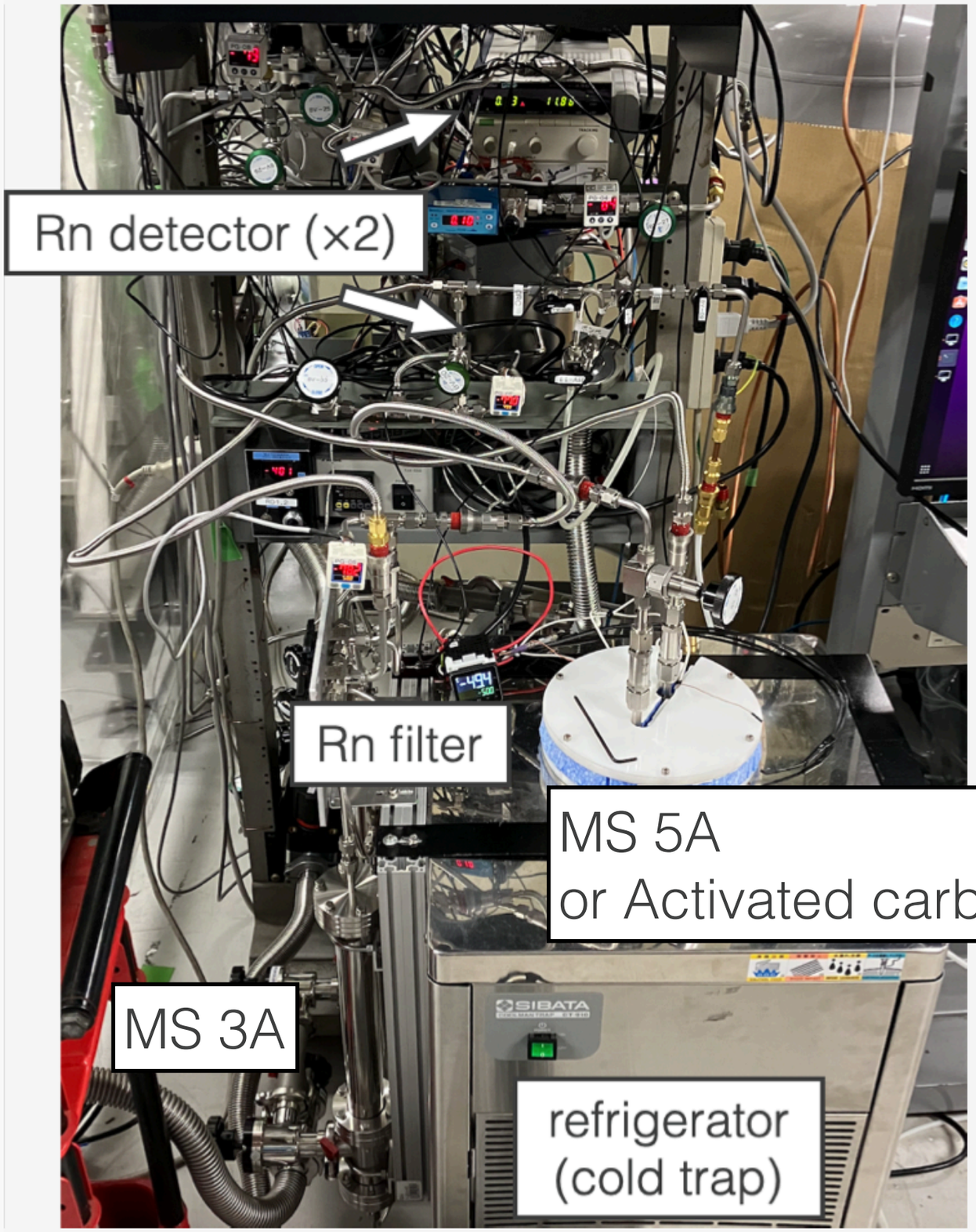




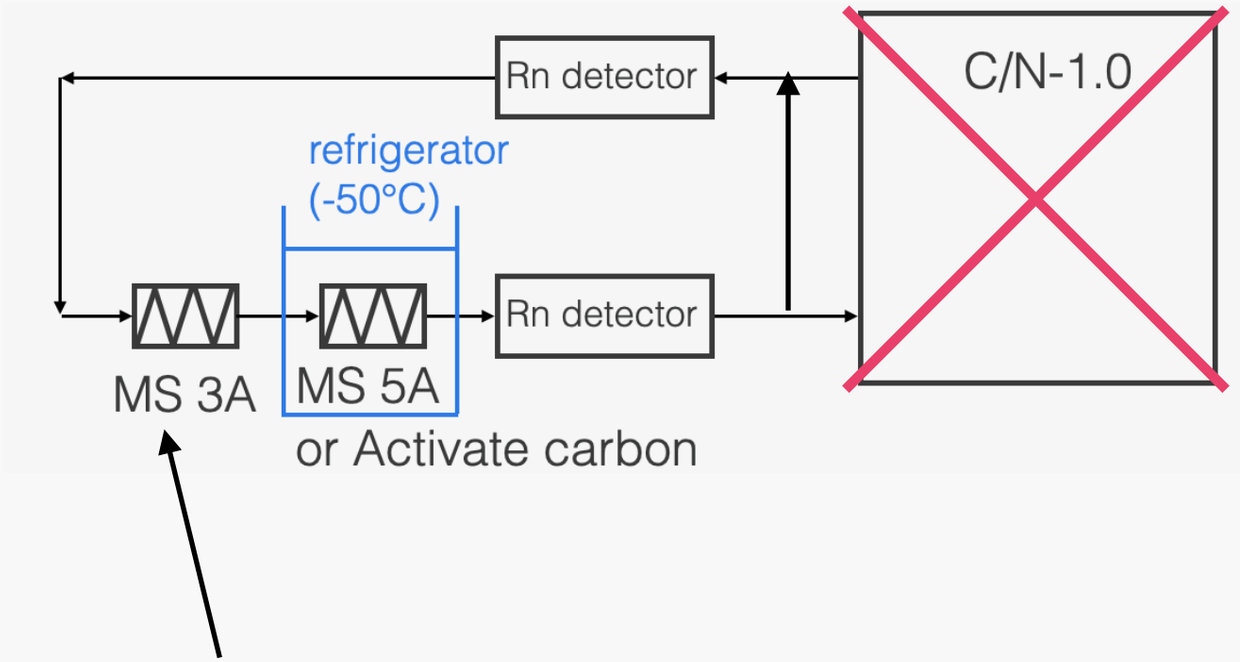
Currently used for NEWAGE detector in Kamioka



Experiment



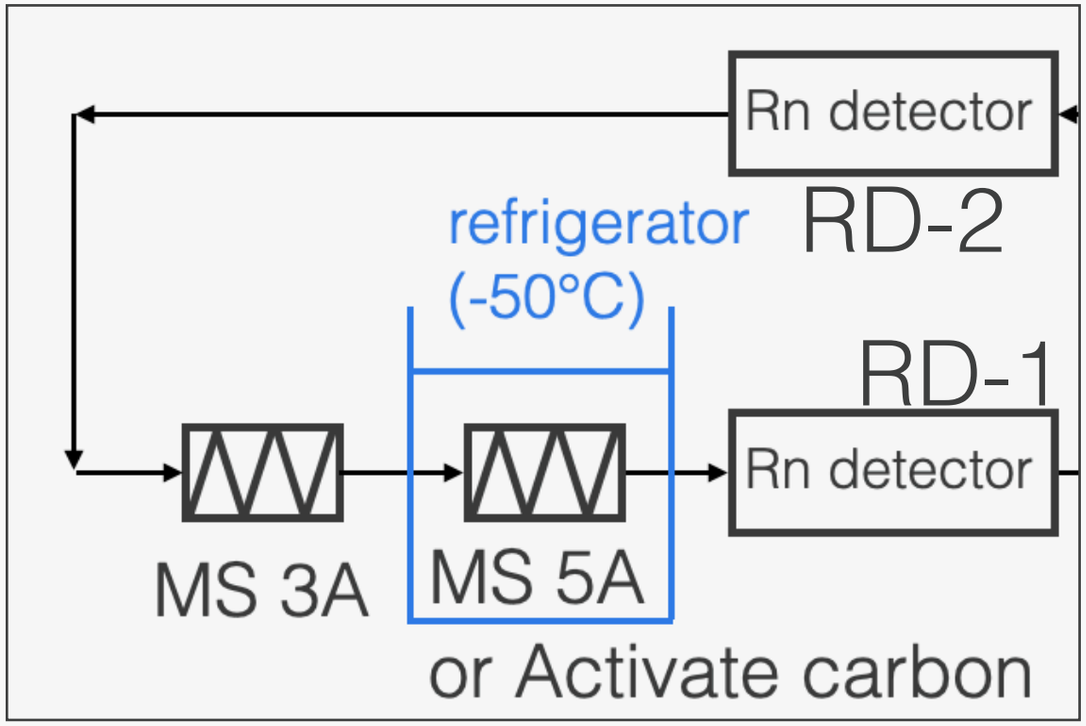
C/N-1.0 was bypassed in this measurement

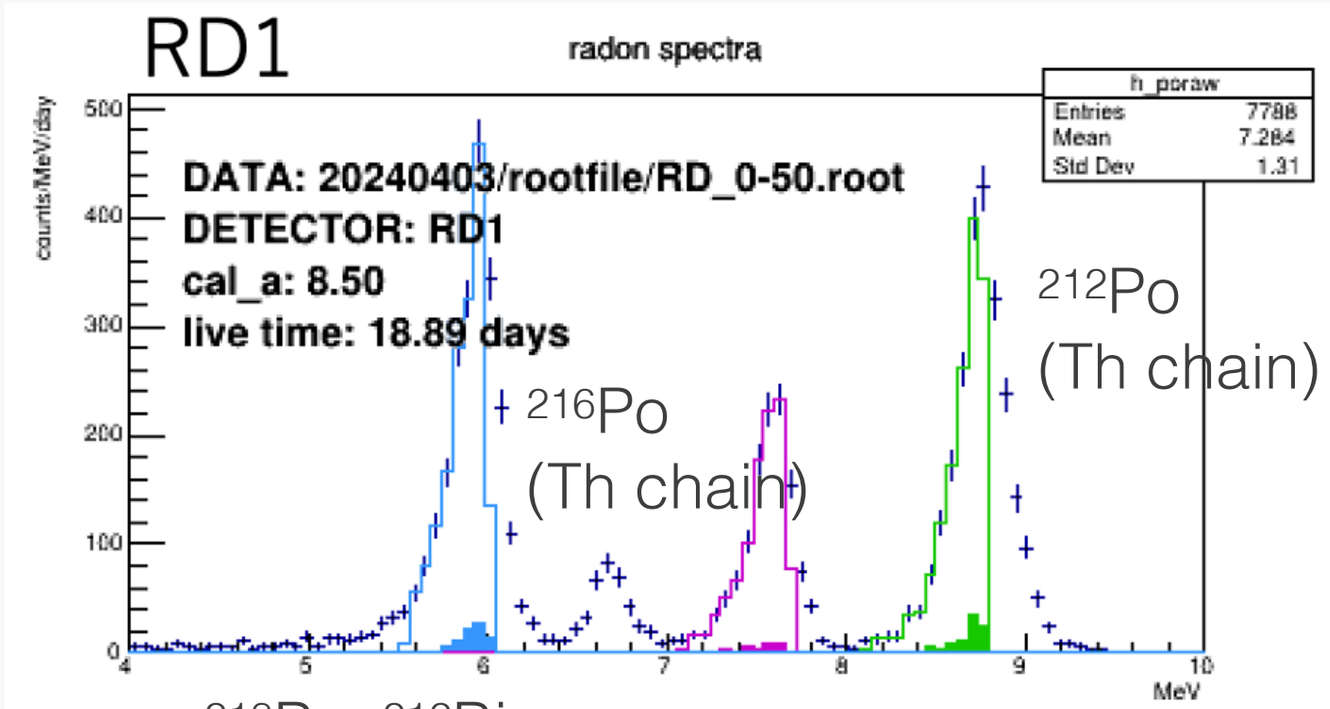


Commercially available, but dirty (= Rn source)

→tested MS 5A and activate carbon for the Rn and water removal

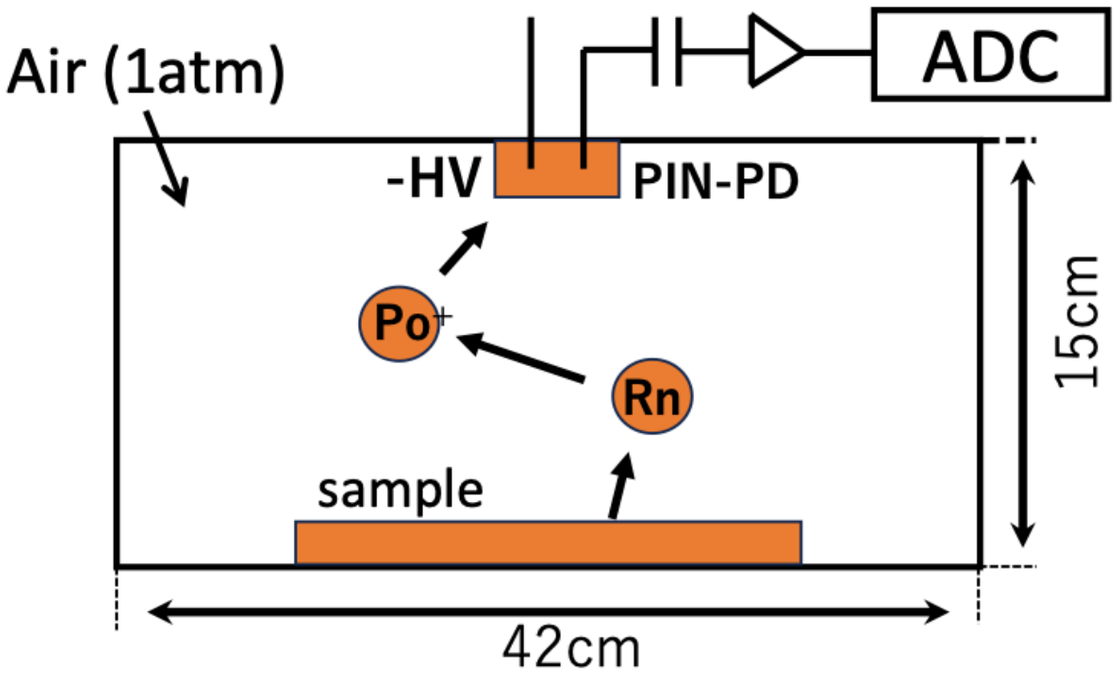
Rn measurement





^{218}Po, ^{212}Bi
(U, Th chain)

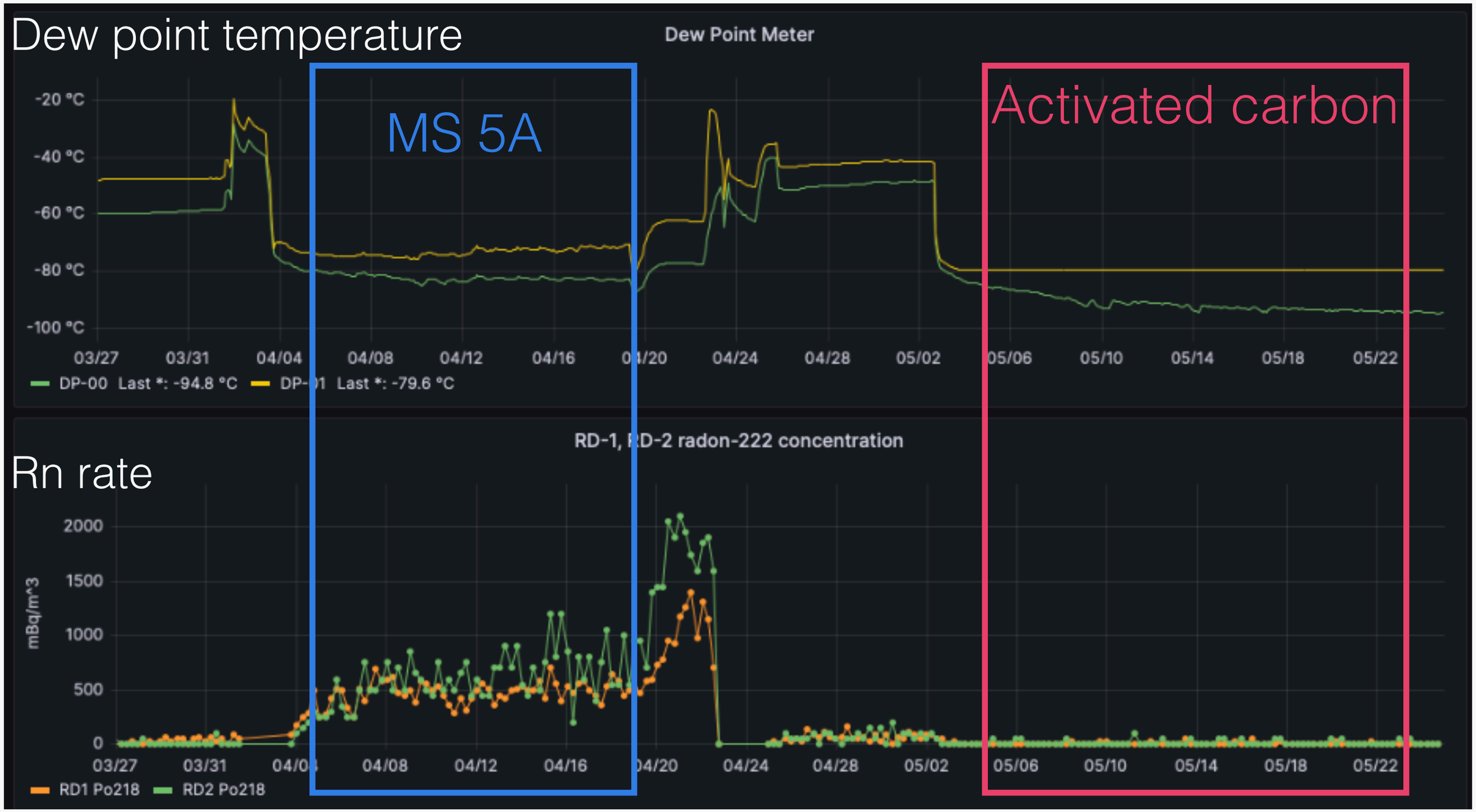
^{214}Po
(U chain)



Electrostatic collection

^{214}Po(U chain) and ^{212}Po (Th chain) were used to estimate ^{222}Rn and ^{220}Rn rate, respectively
(not calibrated in this measurement)

MS 5A vs Activated carbon



Activated carbon was much better than MS 5A!?

Summary

- MS 5A
  - ➡U-chain：55.6 ± 2.6 (56.9 ± 2.6) count / day, RD-1 (RD-2)
  - ➡Th-chain：80.8 ± 2.8 (11.9 ± 1.1) count / day, RD-1 (RD-2)
- Activated carbon
  - ➡U-chain：<0.15 (<0.35) count / day, RD-1 (RD-2)
  - ➡Th-chain：0.60 ± 0.20 (0.87 ± 0.24) count / day, RD-1 (RD-2)
- The removal rate may be affected by temperature
  - ➡-80°C is recommended by Hiroshi's study (currently -50°C)