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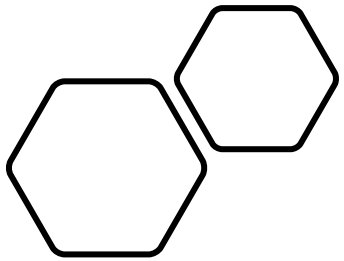

Purification of Organic Compounds Using Microsublimation for ^{14}C Analysis

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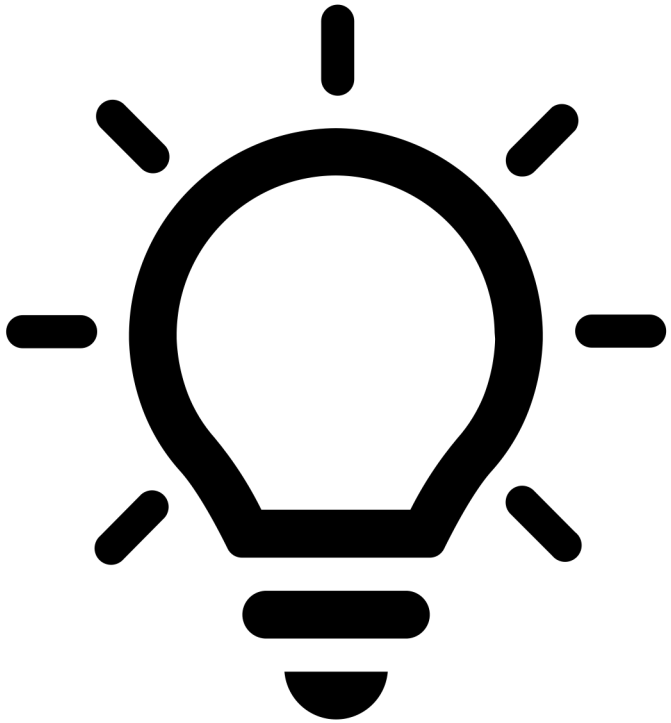
Goal and Idea

- Removal of contaminants introduced by prep-GC purification for small organic samples for ^{14}C dating
- Sublimation is a simple, easy and well-known purification method in chemistry
- Challenge: small samples (down to 50 μg)



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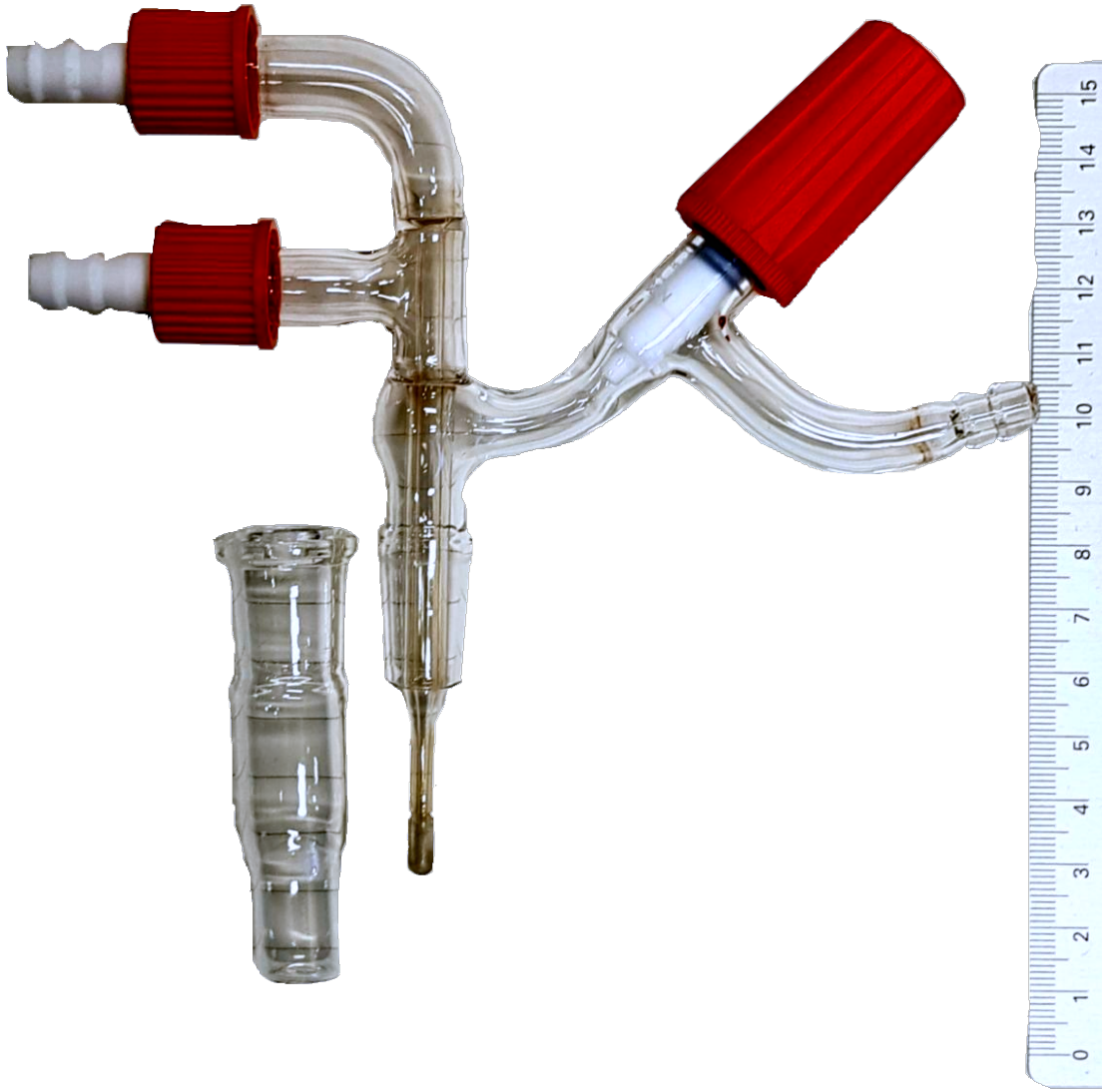
Microsublimation apparatus

- Custom design
- GC vial holder
- Purified compound collected directly on metal cap at bottom of the cooling finger
- Grease-free, evacuable, heat treatable



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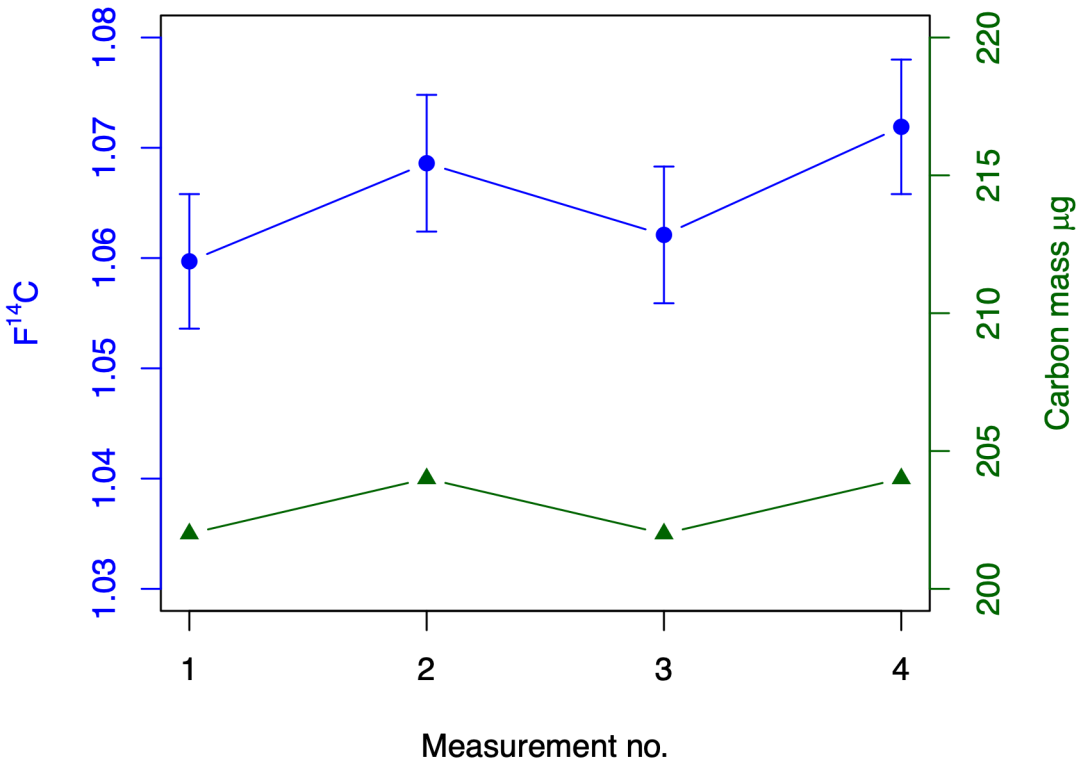
Compounds and Reliability

- Fatty alcohols:
  1-tetradecanol, 1-octadecanol,
  1-docosanol
- Long chain alkanes:
  n-octacosane,
  n-dotriacontane
- Lignin phenols:
  vanillin

- Reliable, reproducible $F^{14}C$ for all compounds tested, but observable presence of constant contamination in small samples



Reproducibility of microsublimation experiments shown for a series of 4 consecutive 1-octadecanol samples.

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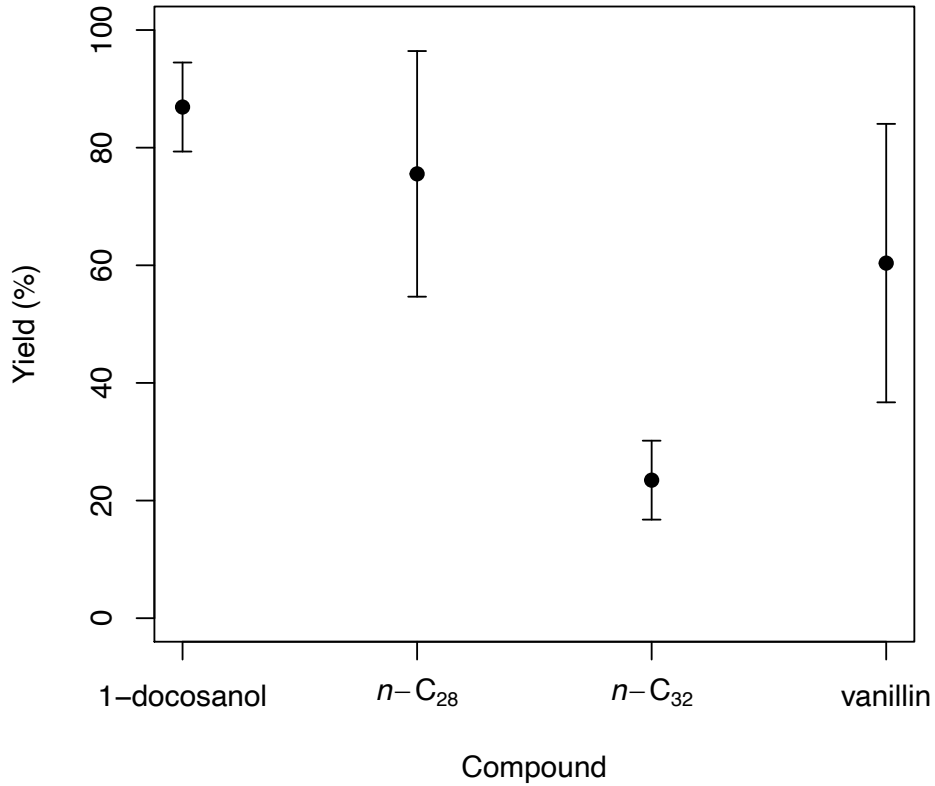
Yields

High yields required, especially for low sample sizes

- High yields for 1-docosanol, *n*-octacosane (*n*-C_{28})
- Moderate yields for vanillin
  - Optimization of sublimation conditions
- Low yields for *n*-dotriacontane (*n*-C_{32})
  - Optimization of sublimation conditions



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Future plans

- Investigate applicability with other substances
- Optimize conditions

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