Mouldy problems and more with CEC determination!_

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Presentation will discuss briefly:

- Mouldy $BaCl_2$ extractions for CEC determination
- NaF titration vs German method for exchangeable acidity determination

Mouldy $BaCl_2$ extractions for CEC determination!

Problem:

- $BaCl_2$ extracts were found to be growing mould within 5 days of extraction when stored at ambient temperature.

Potential Solutions:

- Extracts that were stored at 4° C were found to have grown mould within 72 hours after reaching room temperature.
- Chloroform was not found to inhibit mould growth.

Final Solution:

- Extractions conducted for CEC determination were acidified with 1.45 ml of conc. HNO_3 and 1.35 ml of conc. HCl prior to been made up to the 100 ml mark with $BaCl_2$. (Similar to the acid concentration in the standards used on the ICP-MS).

- Acidified extracts were observed to be stable for at least 2 months.

Comparing the German method (GM) with NaF titration for the determination of exchangeable acidity in soils

- There has been some debate about the merits of determining exchangeable acidity using the GM vs NaF titration.

- Exchangeable acidity by the GM can be calculated from the sum of the CEC exchangeable elements of Fe, Mn, Al and H^+ like so:

  $E_{acidity} = Fe + Mn + Al + H^+$

- A comparison was made between the exchangeable acidity determined by the addition of Fe, Mn, Al, and Free H^+(i.e. GM), versus exchangeable acidity determined by titration (SA10) on the 6th FSCC ring test samples.

Summary of the results from the inter-method comparison

Sample	$E_{acidity}$ from titration (SA10)	$E_{acidity}$ from summation (GM)	6th FSCC ring test mean
FSCC Sample A	**0.50** σ =0.03 n = 4	**0.60** σ = 0.03 n = 4	**0.61**
FSCC Sample B	**0.07** σ = 0.02 n = 3	**0.05** σ = 0.02 n = 4	**0.11**
FSCC Sample C	**-0.12** σ = 0.04 n = 4	**0.01** σ = 0.02 n = 4	**0.08**
FSCC Sample D	**2.92** σ = 0.15 n = 4	**2.76** σ = 0.10 n = 4	**3.56**
FSCC Sample E	**4.07** σ = 0.17 n = 4	**4.05** σ = 0.09 n = 4	**5.45**

Thus, as similar results were obtained, the GM was used in all subsequent analyses

Thank you for your attention!