

“What is metal free leather?”

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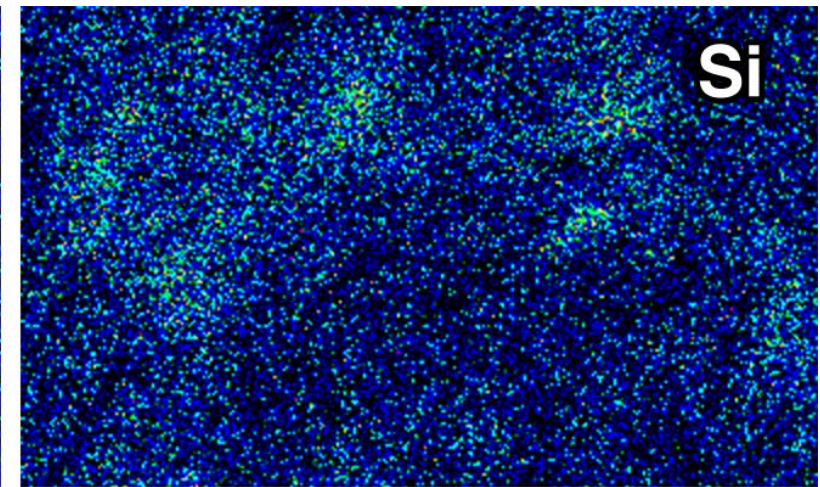
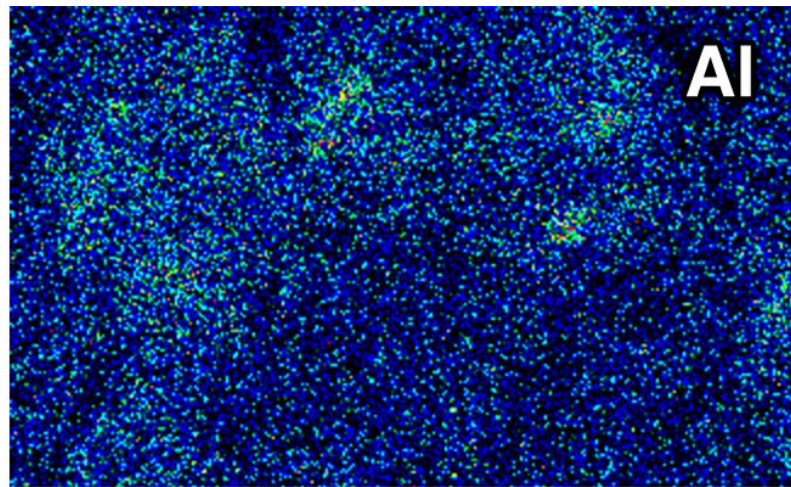
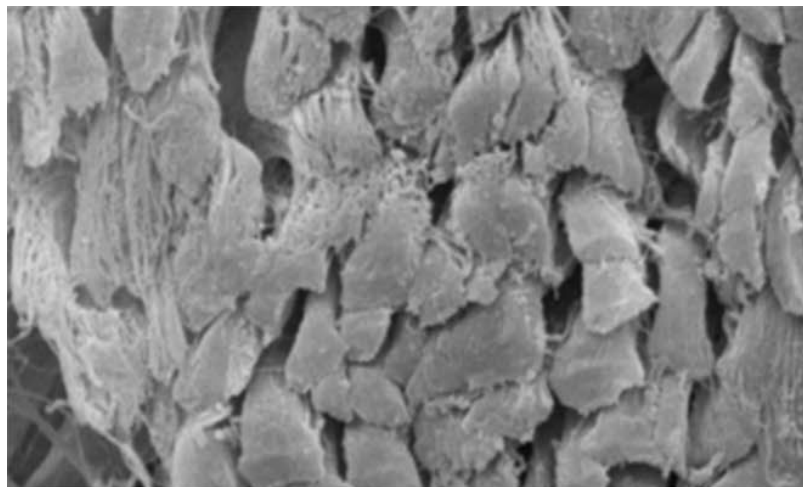
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Introduction

- ▶ Who in this room produces metal free leather? Or produces chemicals for metal free leather? Or has helped develop metal free leather?
- ▶ Seems a simple question; but what if you ask a member of public?
 - Are we misleading public with our adverts and marketing?
- ▶ The questions around terminology and methods of analysis arose during a research project on aluminosilicates
 - Highlighting the issue with current terminology (BS ISO 15115:2019) and methods of analysis (BS EN ISO 17072-2:2022)
 - Early on the question raised are aluminosilicates a metal tannage?

Aluminosilicates as an example...

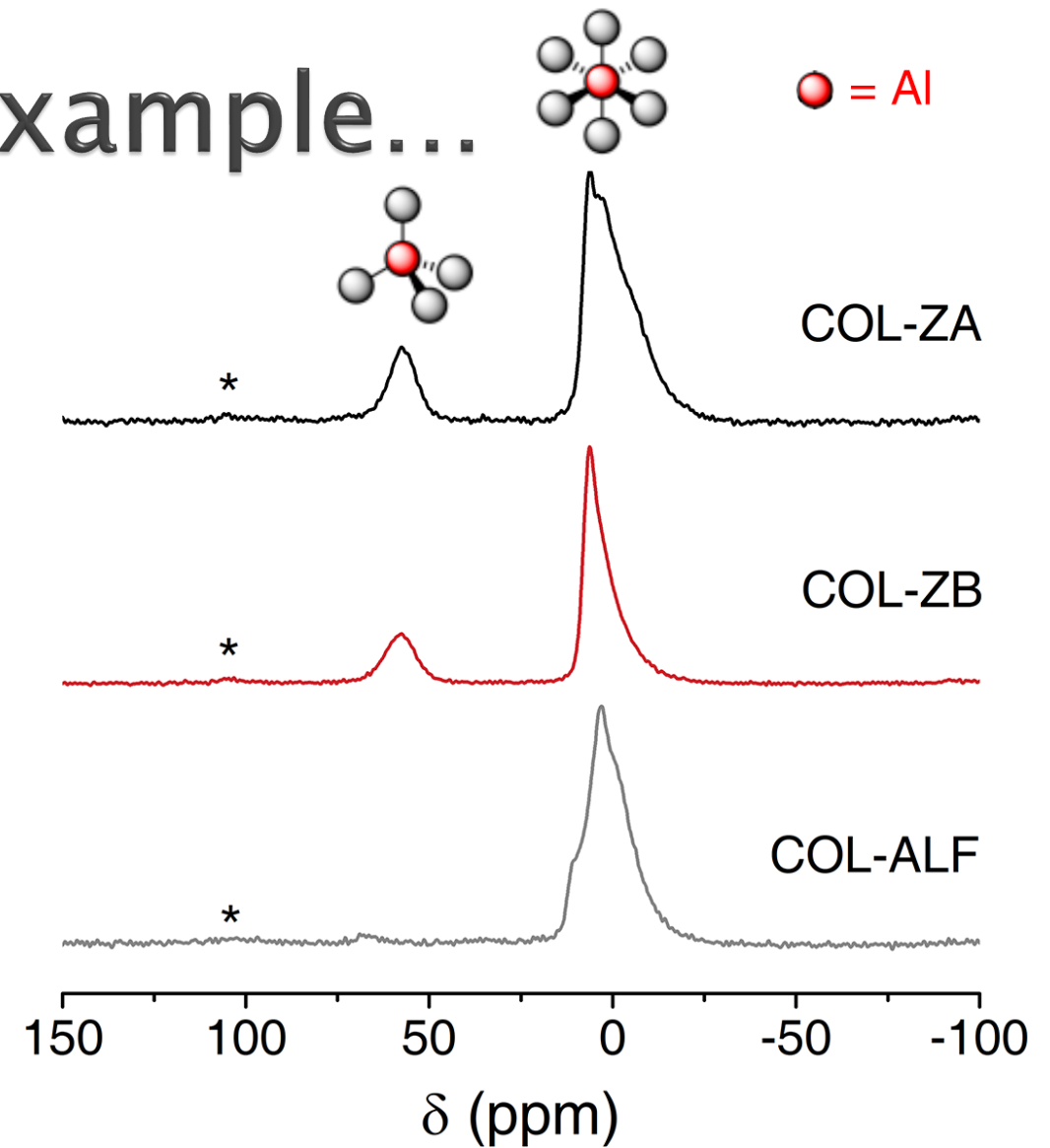
- ▶ Aluminosilicates contain aluminium... but that aluminium is bound into a complex structure and is not free.



For further reading see: Green Chem., 2023, 25, 4260, DOI: 10.1039/d3gc00381g

Aluminosilicates as an example...

- ▶ Further supported with aluminium NMR.
- ▶ Demonstrates a difference between aluminosilicates (ZA and ZB) and a traditional aluminium triformate.
- ▶ It is not pure aluminium that is binding into the collagen structure.



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Testing methodology...

- ▶ But what happens if you analyse it by ISO 17072?
 - Full and complete digestion in very strong acids (HF)
 - Aluminium is shown as present
 - So is it a metal tannage?
- ▶ Consider an analogous situation... What happens if we analysed toothpaste by the same method?
 - Fluorine present
 - Are we brushing our teeth with fluorine?

Concluding remarks and questions...

- ▶ Aluminosilicates contain aluminium – but this aluminium is not ‘free’ and the tannage does not behave like aluminium.
 - It could be argued as not being a metal tannage at all! It is an inorganic complex...
 - “Hide or skin converted to leather, where the total content of all tanning metals (Cr, Al, Ti, Zr, Fe) in the leather is less than or equal to 0,1 % (mass of all metals/total dry weight of leather)”
- ▶ Even if the tannage does come out of the leather it does so as an aluminosilicate – not free aluminium!

Concluding remarks and questions...

- ▶ Questions our method of analysis and our way of defining leathers.
- ▶ Incorrect classification (ISO 15115) could stifle innovation.
- ▶ We should redefine or remove the term metal-free leather
 - Instead of assessing leather as metal-free should we instead be assessing for free metal?

Thank you for listening