SUPPORTING INFORMATION FOR

Hyphenating supercritical fluid chromatography and inductively coupled plasma mass spectrometry: A proof of concept

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Figure S8. Extended SFC-ICP-MS SICs for Mn, Fe and Cu in a coal tar (red) and the corresponding blank (black).

Parameter	Value		
Run time	25 min		
Mobile phase (A:B)	CO ₂ :MeOH (0.1% FA)		
Flow Rate	0.75 mL/min		
Gradient (A:B)	Initial: 99:1		
	5 min: 96:4 (0.2% B / min)		
	25 min: 70:30 (1.3% B / min)		
	25.1 min: 99:1		
Injection Volume	1.0 µL		
Injection Solvent	THF		
Column	2-PIC (3.0 x 100 mm, 1.7 μm)		
Column Temperature	60 °C		
ABPR	105 Bar		

Table S1. Fast chromatographic method for the analysis of the two metal-containing compounds.

 Table S2. SFC method for the speciation analysis of unconventional oils.

Parameter	Value	
Run time	80 min	
Mobile phase (A:B)	CO2:MeOH (0.1% FA)	
Flow Rate	0.75 mL/min	
Gradient	Initial: 99:1	
	20 min: 96:4 (0.2% B / min)	
	46 min: 70:30 (1% B / min)	
	70 min: 70:30	
	70.2 min: 99:1	
Injection Volume	2.0 µL	
Injection Solvent	THF	
Column	2-PIC (3.0 x 100 mm, 1.7 μm)	
Column Temperature	60 ∘C	
ABPR	120 Bar	

Parameter	Value				
Plasma Parameters					
RF Power	1600 W				
RF Matching	2.15 V				
Sample Depth	18.0 mm				
Carrier Gas (Ar)	1.00 L/min				
Option Gas (O2)	0.50 L/ min				
Makeup Gas (Ar)	0.80 L/min				
Lenses Parameters					
Extract 1	0.0 V				
Extract 2	-110.0 V				
Omega Bias	-100 V				
Omega Lens	3.2 V				
Cell Entrance	-40 V				
Cell Exit	-60 V				
Deflect	-0.6 V				
Plate Bias	-60 V				
Cell Parameters					
He Flow	4.0 mL/min				
Octopole Bias	-18.0 V				
Octopole RF	180 V				
Energy Discrimination	5.0 V				

Table S3. ICP MS tune parameters used for all the analyses carried out in this work

Table S4. Slopes corresponding to the standard addition calibration curves for the quantification of Zn, Cr and Al in a bio oil and two bio lubricants

Element	Slope (DL Calculation)	Slope (Bio Oil)	Slope (Bio Lub 1)	Slope (Bio Lub 2)
Zn	10186	93	380	50
Cr	265509	23805	14114	n.m.*
Al	8781	1510	1388	n.m.*

* Cr and Al have not been measured in Bio Lub 2.



Figure S1. Detailed schematic representation of the SFC-ICP-MS interface.



Figure S2. Photo of the interface set up during analysis.



Figure S3. P-T-X diagram of CO₂ and MeOH. For the conditions used in this work, supercritical conditions (above the plane) are achieved at least until a 20% of MeOH₁₆.



Figure S4. Injection of 1µL of a standard mix containing Na, Cr and Pb in FIA mode at temperatures from 30°C to 70°C.



Figure S5. Flow injection analysis via standard additions method results for the analysis of 27Al, 63Cu and 66Zn in a pyrolysis oil sample.



Figure S6. Magnified section of the first 10 minutes of the SFC-ICP-MS SICs for the analysis of pyrolysis oil produced from milorganite fertilizer (blue), coal tar (red) and the corresponding blank (THF).



Figure S7. SFC-ICP-MS SICs for Mn, Fe and Cu in a coal tar (red) and the corresponding blank (black).



Figure S8. Extended SFC-ICP-MS SICs for Mn, Fe and Cu in a coal tar (red) and the corresponding blank (black).