Electronic supplementary information

ESI Table 1: Setting of microwave digestion program by Bode.[1]

Duration in min	***Temperature in °C***	***E in W***
2.5	*Room temperature to 80*	*500*
8	*80 to 160*	*800*
3	*160 to 220*	*1200*
15	*220*	*1200*

ESI Table 2: Settings of the ICP-OES measurements.

	iCAP 6000
RF power	*1150 W*
Plasma gas flow (Ar)	*14 L/min*
Auxiliary gas flow (Ar)	*0.7 L/min*
Nebulizer gas flow (Ar)	*0.6 L/min*
Pumping rate	*25 rpm*
Measurement mode	*axial and radial*
Wavelengths Fe	*259.940 nm, 238.204 nm, 239.562 nm, 240.488 nm, 261.187 nm*
Wavelengths single element layer measurements	*Al: 308.215 nm, 394.401 nm, 396.152 nm* *Ca: 315.887 nm*, 396.847 nm*, 422.673 nm** *Cd: 226.502 nm, 228.802nm* *Co: 228.616 nm, 237.862 nm, 238.892 nm* *Cr: 267.716 nm, 283.563 nm, 284.325* *Fe: 238.204 nm, 239.562 nm, 259.940 nm* *La: 333.749 nm, 379.478 nm, 412.323 nm* *Mg: 279.553 nm*, 280.270 nm*, 285.213 nm** *Pb: 216.999 nm, 220.353 nm, 261.418 nm* *Sr: 216.596 nm*, 421.552 nm** *Zn: 202.548 nm, 206.200 nm, 213.856 nm*

** Were measured in axial and radial mode.*

ESI Table 3: LOD and LOQ and Blank levels, according to calibration curve method from DIN 32645.

	XRF	**LA-ICP-MS**				**LIBS**			
		54 Fe	56 Fe	57 Fe	58 Fe	Fe 238,2 nm	Fe 239,5 nm	Fe 259,9 nm	Fe 275,6 nm
LOD [mg/kg]	39	162	146	139	148	271	353	506	509
LOQ [mg/kg]	144	556	504	483	511	885	1136	1674	1684
Mean Blank intensity	1613	-72	421	-15	31	0,0225	0,0227	0,0139	0,0141
STD Blank	335	2379	4470	122	188	0,0383	0,0765	0,1060	0,0773
Mean Blank [mg/kg]	-2	82	95	93	111	109	207	108	243

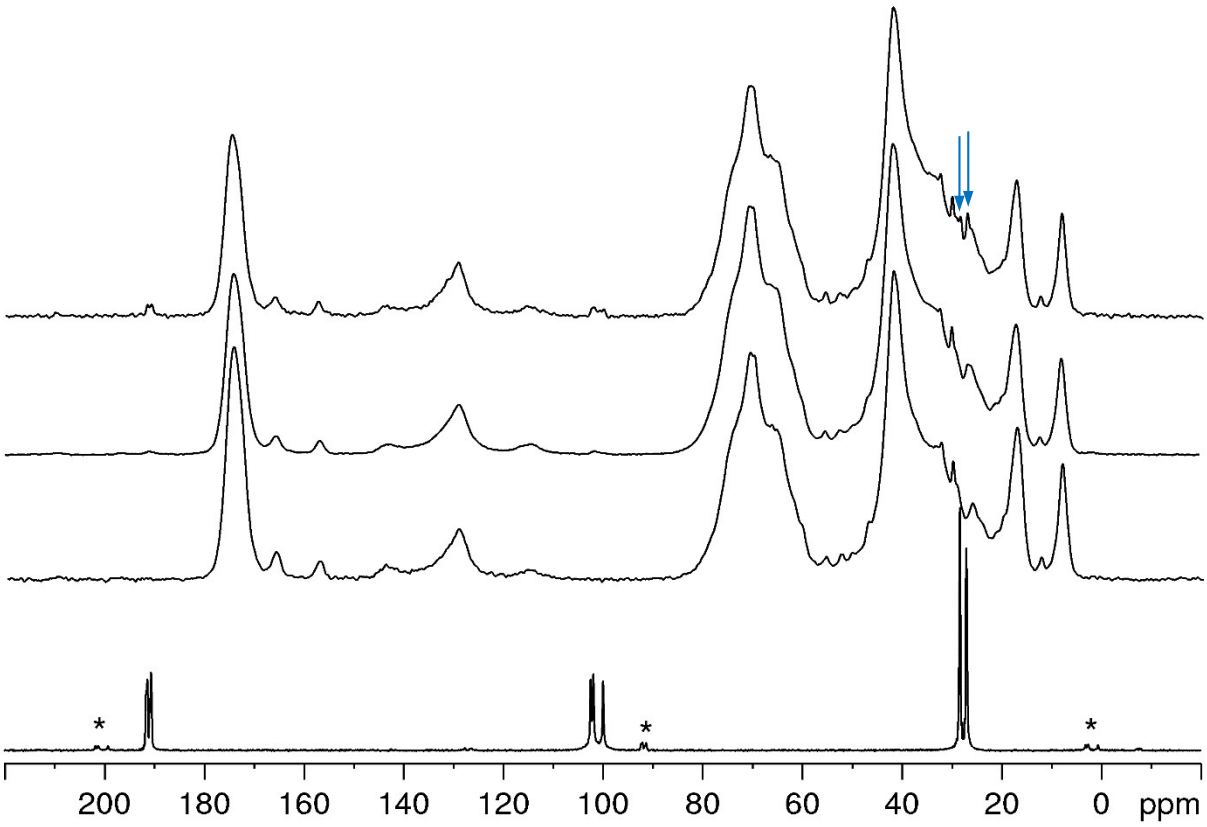

Figure 1: Comparison of the ^{13}C CP/MAS NMR spectra. From bottom to top: pure $Al(acac)_3$, polymer lacquer without and with 1000 mg/kg and 2000 mg/kg $Al(acac)_3$ added, respectively. Asterisks mark spinning side bands (ν_R = 10 kHz). Small arrows indicate the remaining methyl signals of $Al(acac)_3$ in the upper spectrum. Note that these signals cannot be detected in the 1000 mg/kg $Al(acac)_3$ lacquer indicating an incorporation into the polymer network.

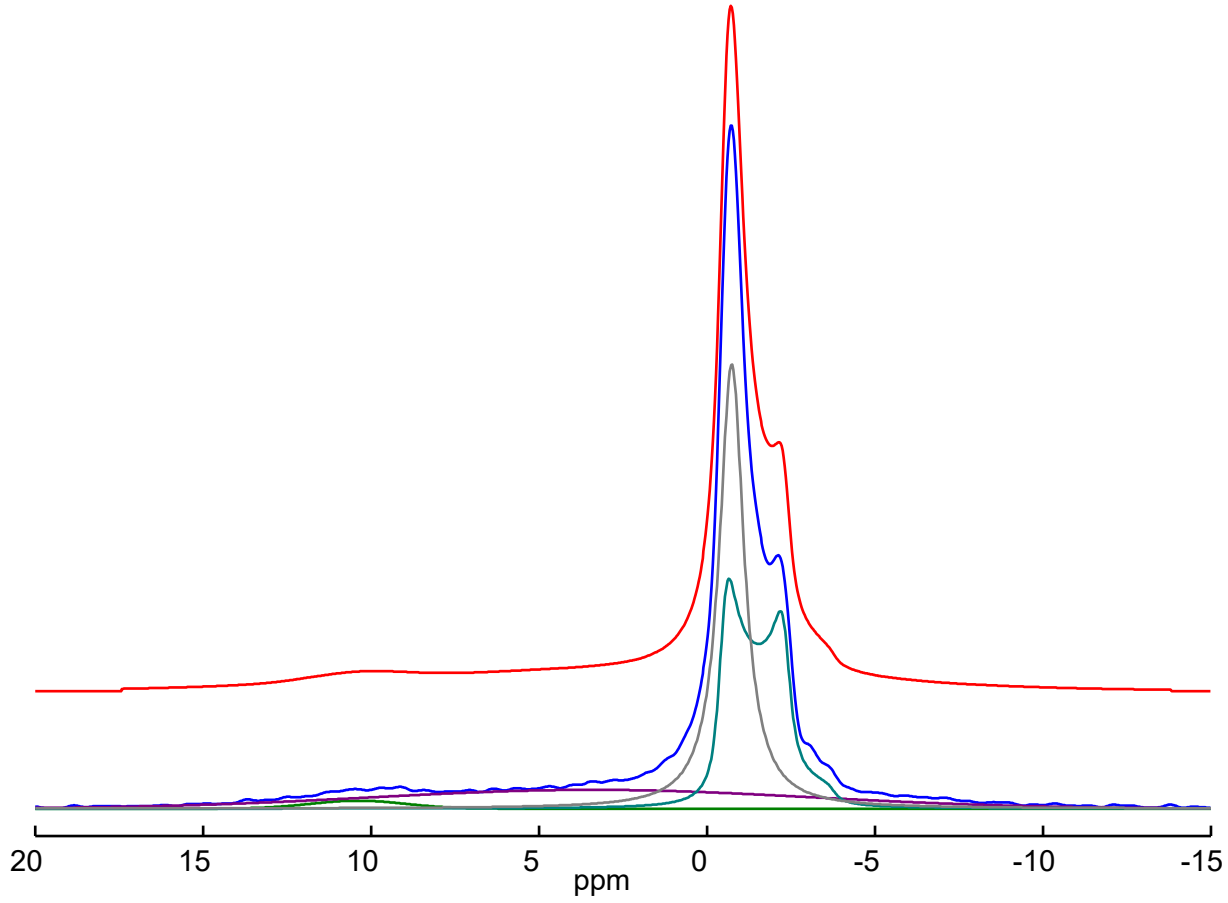

Figure 2: Deconvolution of the ^{27}Al MAS spectrum of the sample containing 2000 mg/kg $Al(acac)_3$, blue: experimental spectrum, red: sum of the signals obtained during deconvolution, the signal in green was obtained using the quadrupolar parameters for $Al(acac)_3$ with increased line broadening. The low intensity signals > 0 ppm are not resolved and should not be interpreted and are therefore approximated by a minimum number of two broad signals (DMFIT)[2]

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References

1 J. Bode, PhD thesis, TU Bergakademie Freiberg, 2021.

2 D. Massiot, F. Fayon, M. Capron, I. King, S. Le Calvé, B. Alonso, J.-O. Durand, B. Bujoli, Z. Gan and G. Hoatson, Modelling one- and two-dimensional solid-state NMR spectra, *Magn. Reson. Chem.*, 2002, **40**, 70–76.