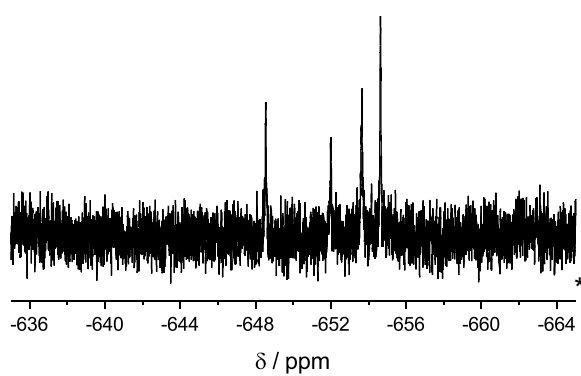


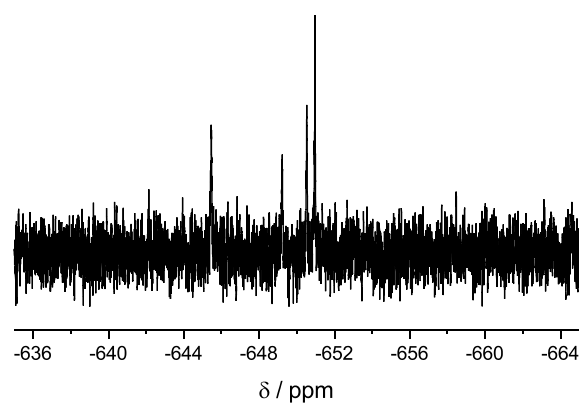
Supporting Information

^{119}Sn NMR spectroscopy in D_6 -DMSO solution

a)



b)



c)

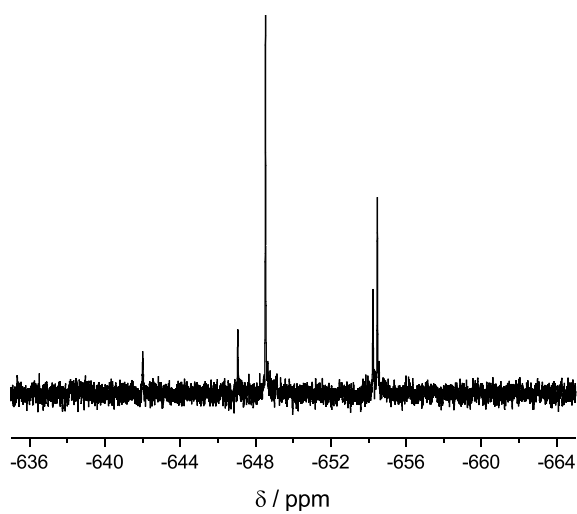


Figure S 1 ^{119}Sn NMR spectra of compound a) **1**, b) **2** and c) **3** in D_6 -DMSO solutions.

Dynamic light scattering

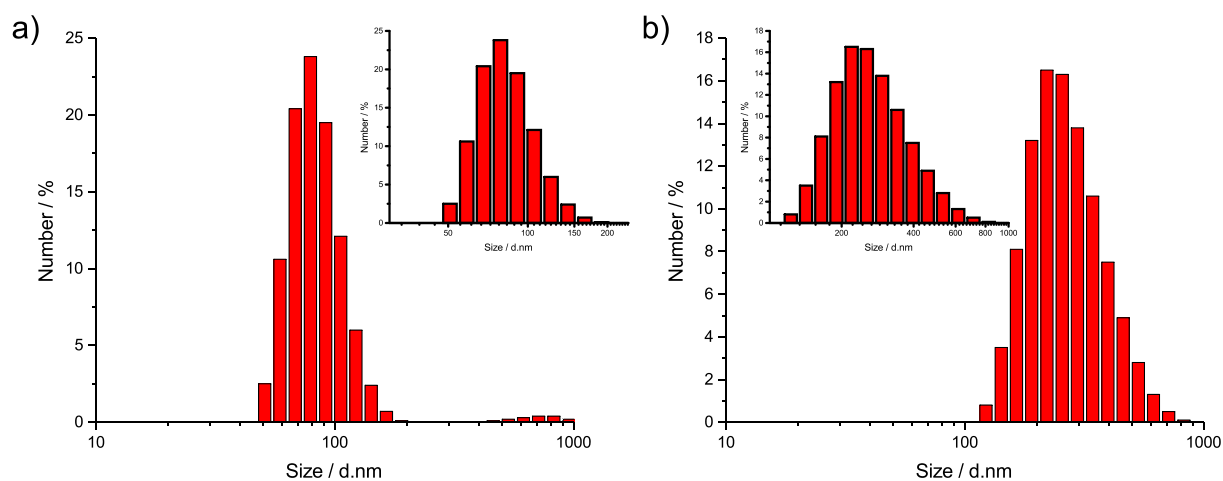


Figure S 2 Dynamic light scattering measurement of a) compound **2** in DMSO and b) **Ox-2** in ethylene glycol.

Solid state NMR spectroscopy

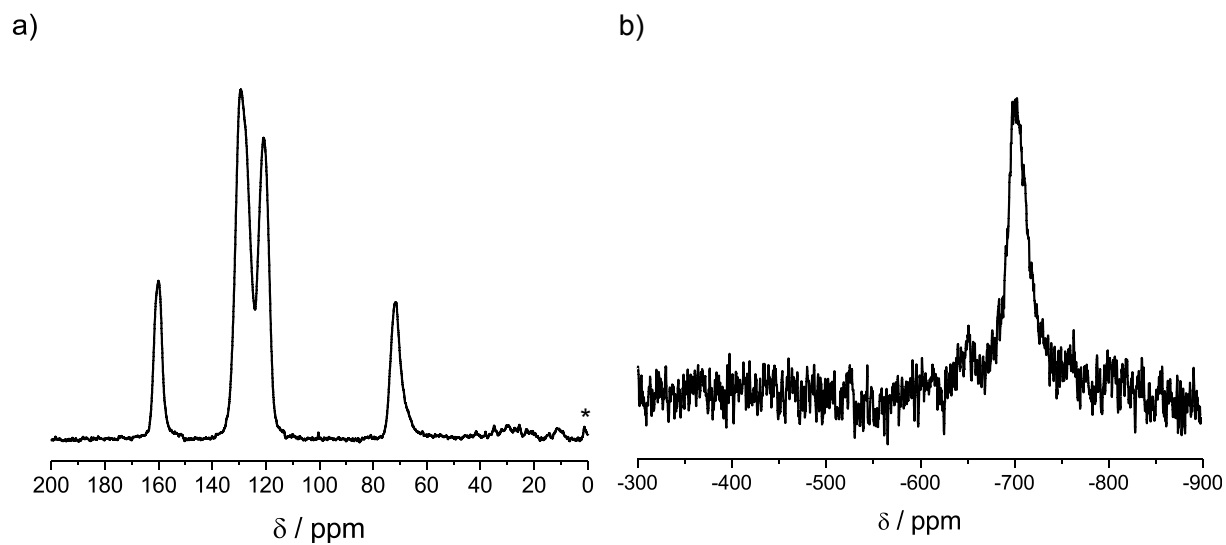


Figure S 3 a) $^{13}\text{C}\{^1\text{H}\}$ CP MAS NMR and b) ^{119}Sn CP MAS NMR spectra of compound **1**. The asterisk * marks spinning side bands.

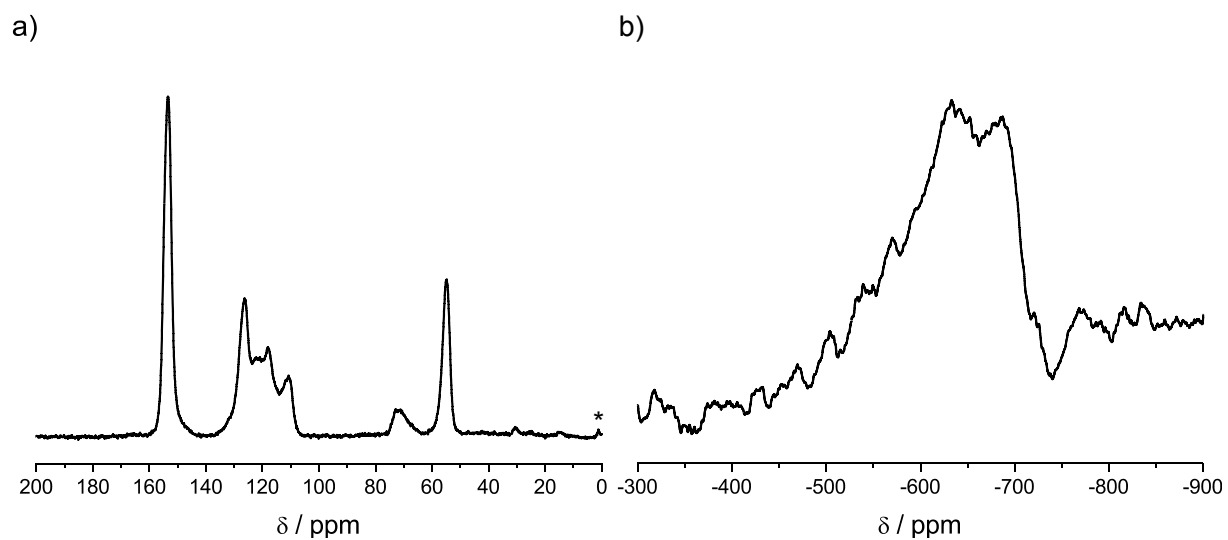


Figure S 4 a) $^{13}\text{C}\{^1\text{H}\}$ CP MAS NMR and b) ^{119}Sn CP MAS NMR spectra of compound **2**. The asterisk * marks spinning side bands.

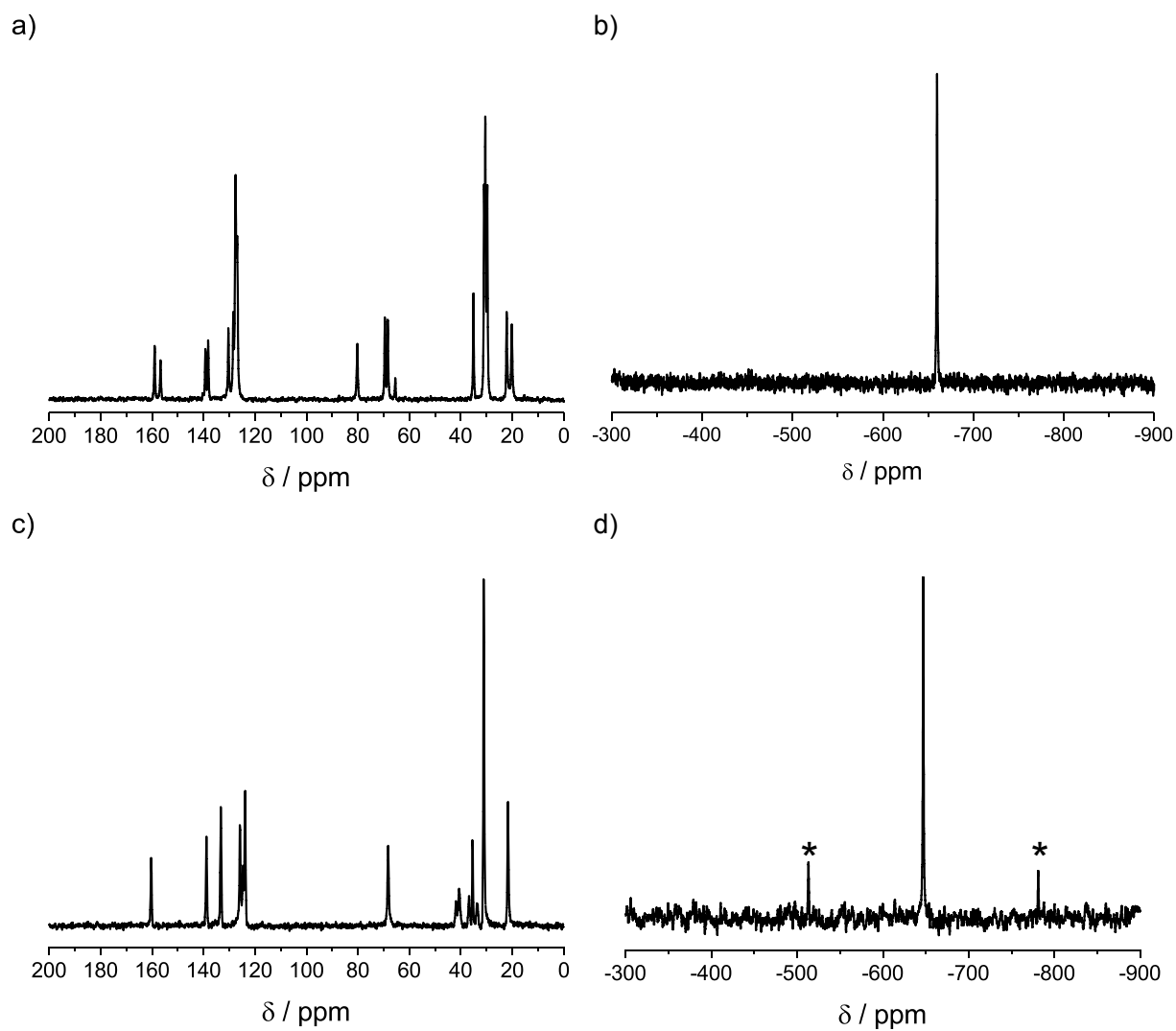


Figure S 5 a) $^{13}\text{C}\{^1\text{H}\}$ CP MAS NMR and b) ^{119}Sn CP MAS NMR spectra of compound **3** and c) $^{13}\text{C}\{^1\text{H}\}$ CP MAS NMR and d) ^{119}Sn CP MAS NMR spectra of crystals of **3**(dms_o)₂ · 2 DMSO. The asterisks in d) indicate rotational sidebands.

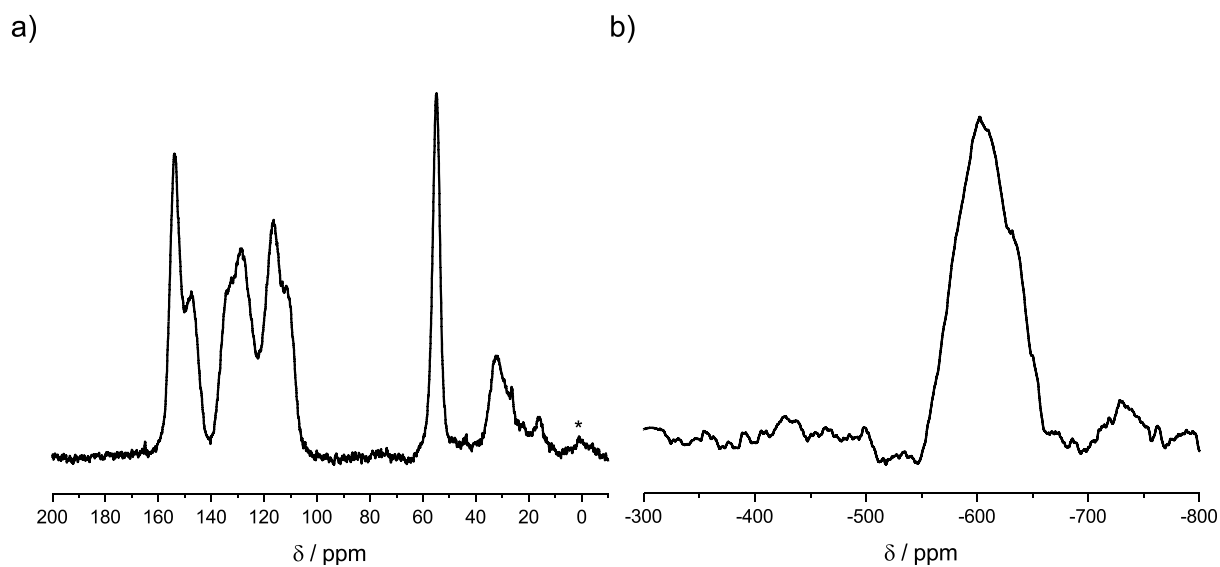


Figure S 6 a) $^{13}\text{C}\{^1\text{H}\}$ CP MAS NMR and b) ^{119}Sn CP MAS NMR spectra of compound **HM-2**. The asterisk * marks spinning side bands.

Thermal analysis

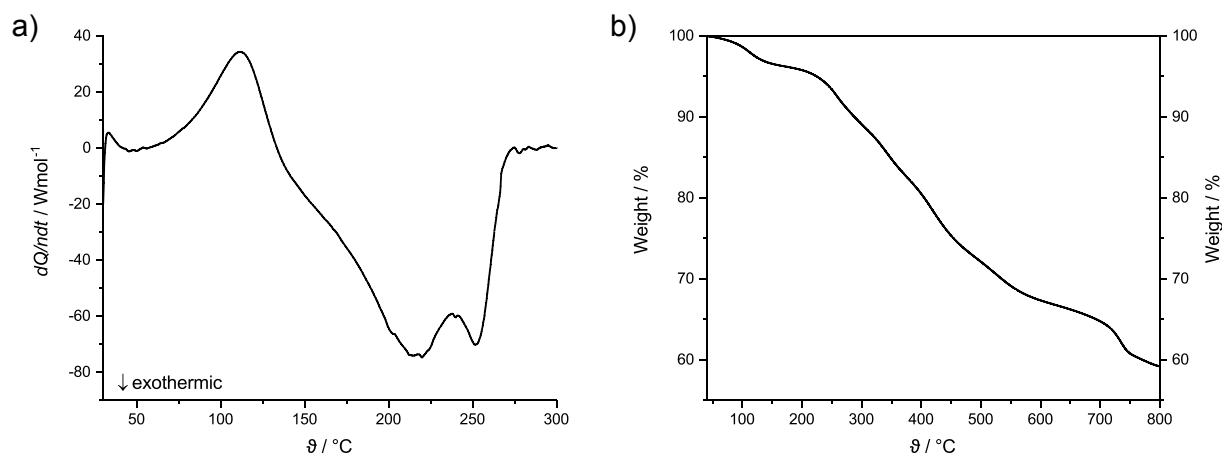


Figure S 7 a) Differential scanning calorimetry (DSC) and b) thermal gravimetric analysis (TGA) of compound **2**; heating rate 10 K min^{-1} , N_2 atmosphere for DSC and Ar atmosphere TGA measurement, inert gas volume flow 50 mL min^{-1} (DSC) / 60 mL min^{-1} (TGA).

Powder X-ray diffraction

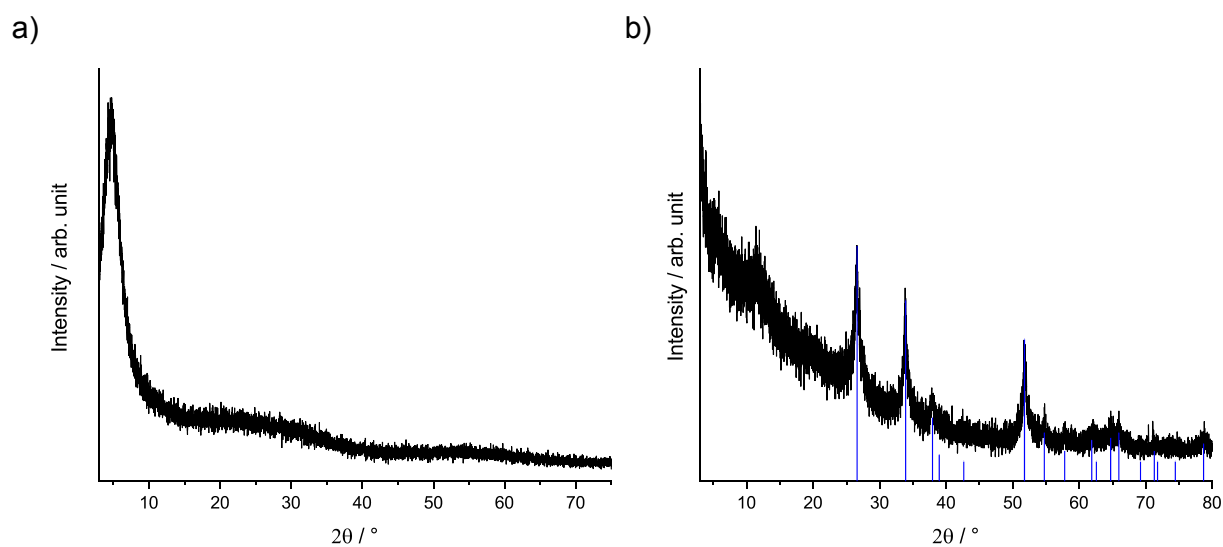


Figure S 8 Powder X-ray diffraction pattern of a) **HM-2** and b) **Ox-2**. The blue bars in b) display the diffraction pattern of tetragonal SnO₂ (ICDD no. 00-041-1445).

ATR-FT-IR spectroscopy

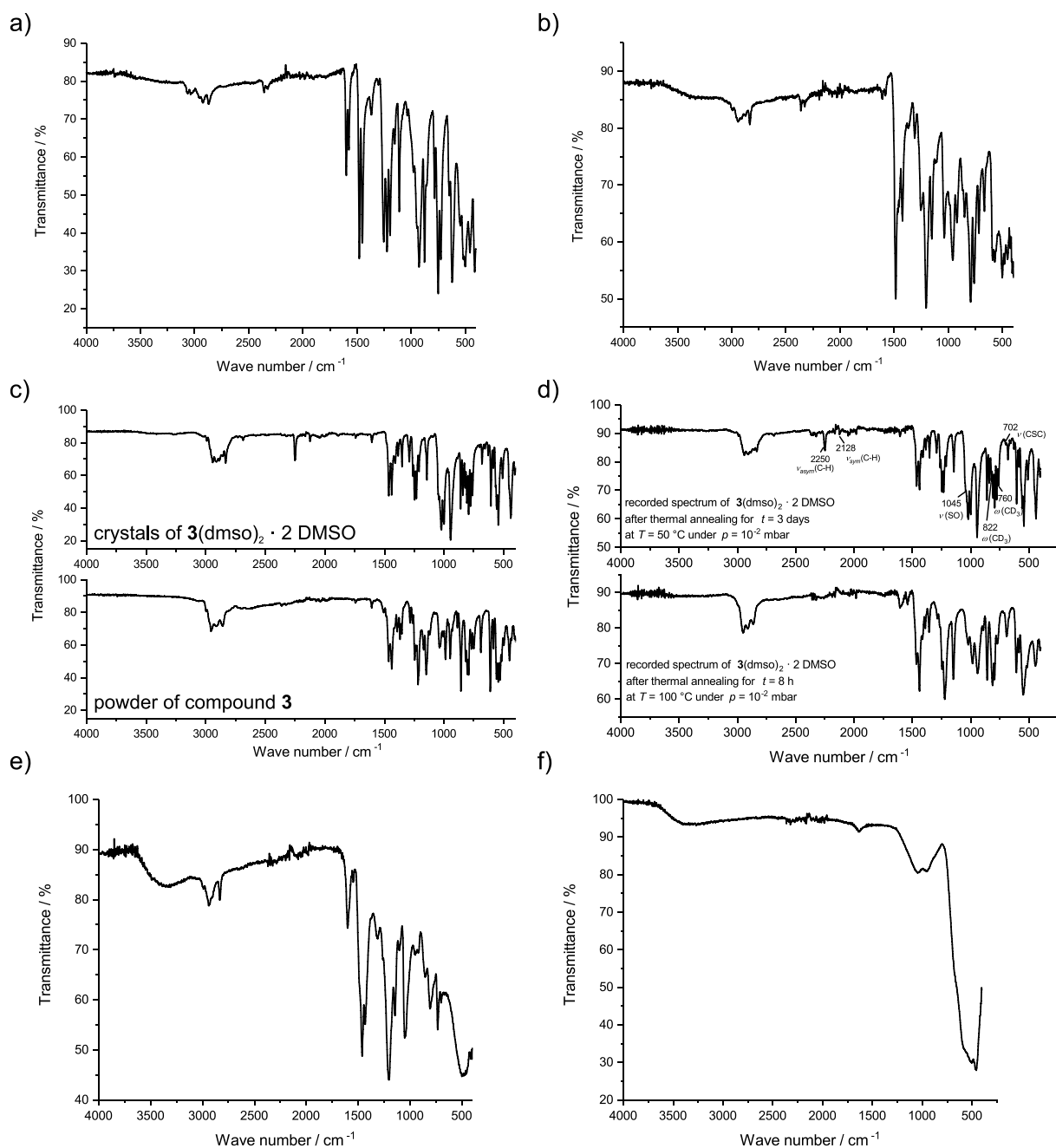


Figure S 9 ATR-FT-IR spectra of compound a) **1**, b) **2**, c) $3(\text{dmsO})_2 \cdot 2 \text{DMSO}$ (top) and **3** (bottom), d) $3(\text{dmsO})_2 \cdot 2 \text{DMSO}$ after thermal annealing (spectra depicted for two setups of parameters) e) **HM-2** and f) **Ox-2**.

Scanning electron microscopy

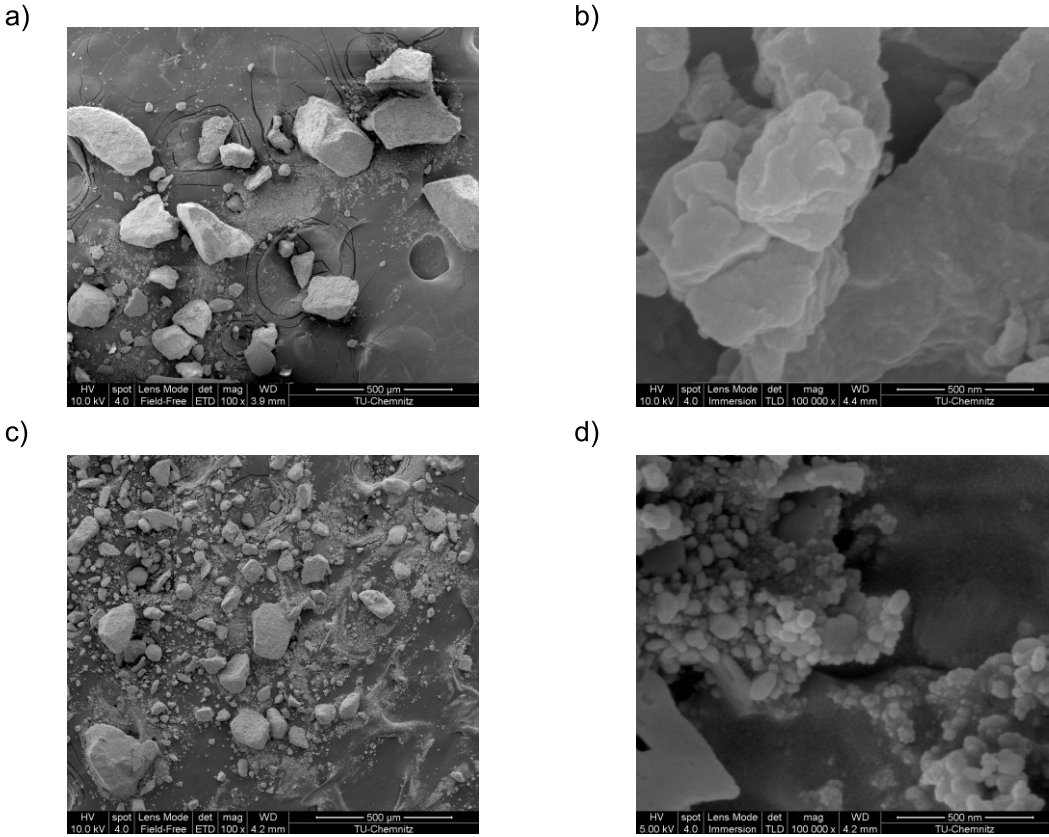


Figure S 10 Scanning electron microscopy images of **HM-2** in picture a) and b) and of **Ox-2** in picture c) and d).

Computational studies

Table S1 xyz data of the optimized geometries of (1) ₄ and (2) ₄ .	
(1) ₄	(2) ₄
124 Energy = -4223.680227108279 H -0.191609 -5.389533 -2.186867 H 0.856409 -5.094620 -0.160344 H 3.305517 -5.364473 6.875100 H 1.578407 -6.925674 7.736426 H -2.159005 -5.235938 -3.666194 C 2.275767 -5.267388 6.556531 C -1.085880 -4.884919 -1.842194 C 1.309892 -6.142882 7.040057 O 0.182044 -4.346506 0.263546 C 0.023644 -4.677993 1.626520 H 0.691677 -3.381925 0.155125 H 2.670631 -3.592346 5.255505 C -2.192521 -4.799160 -2.677714 C 1.929138 -4.272796 5.652040 H 4.071002 -0.028045 -0.252426 C -1.084836 -4.326957 -0.563763 H 4.080525 -1.106925 1.982543 C -0.005776 -6.006881 6.1612797 H -0.764339 -6.687883 6.979539 C 3.147877 -0.368049 0.195214 C 3.150699 -0.969781 1.447546 C 0.606666 -4.131316 5.233843 C -0.380812 -5.004929 5.722376 H 1.935257 0.275170 -1.451534 C 1.946198 -0.196781 -0.477782 C 1.960426 -1.364981 2.039108 H 1.928657 -1.803609 3.025472 C -3.341929 -4.157223 -2.232022 O 0.302437 -3.124534 4.368060 C -2.257525 -3.697722 -0.136019 H -0.760916 -1.587352 -1.136879 O -2.046513 -4.864443 3.901494 C 0.742038 -0.631245 0.071289 H -4.212228 -4.084174 -2.870100 C 0.764104 -1.189025 1.357493 H -2.426868 -5.623546 5.746048 C -1.820125 -4.826155 5.313159 H 3.659004 1.806221 3.548378 C -3.378430 -3.615697 -0.954818 H -0.342517 0.050325 -1.640890 C -0.496761 -0.591667 -0.776635 O -2.331353 -3.121679 1.114970 H 5.697705 6.097718 -0.976231 O -0.394539 -1.584440 1.975398 H 4.266817 4.347837 0.049606 C 2.584041 1.695799 3.501721 H 2.414763 2.570367 1.529532 H 2.429595 0.719992 5.412091 C 4.655825 6.018683 -1.258185 C 3.862868 5.036189 -0.680798 H -2.189357 -3.878116 5.727713 C 1.904342 2.127272 2.372303 C 1.897614 1.090626 4.547168 H -4.261580 -3.118199 -0.576885 H 4.723227 7.680080 -2.623550 C 4.111960 6.906156 -2.179878 O -1.677258 -0.090172 -0.094163 O 1.780953 3.927036 -0.459704 C 2.518498 4.919795 -1.031070 H -4.170487 -3.072487 3.227210 O -2.445392 -1.924740 3.441456 H -3.446752 -0.047241 -5.319402 C 0.525160 1.985096 2.305991 C 0.518232 0.955846 4.471890 H -2.049966 1.875199 -4.638207 C 2.768992 6.794149 -2.520226 O -0.115736 2.409445 1.170592 H 0.403438 4.712093 -2.931986 C 1.959125 5.805809 -1.968395 C -3.524968 0.350108 -4.316998 H -0.022921 0.480506 5.279801 C -2.739412 1.429486 -3.931699 C -3.808277 -2.253194 3.849550 H -3.753260 -2.603321 4.876703 O -0.194561 1.429811 3.372967 O -1.055993 2.785355 -1.168393 H -5.007467 -1.070560 -3.687278 C -4.403058 -0.219906 -3.401079	156 Energy = -5139.820604834179 H -0.762875 -5.429555 -2.296970 H 0.452518 -5.098134 -0.346537 H 3.340219 -5.442380 6.550071 C 2.300123 -5.301055 6.290121 C -1.620860 -4.933276 -1.862568 C 1.345449 -6.150373 6.849453 C -0.198858 -4.361156 0.129142 O -0.266044 -4.704554 1.497171 H 0.290793 -3.389483 -0.006656 H 2.651037 -3.659032 4.952468 C -2.807432 -4.899273 -2.596594 C 1.915049 -4.310404 5.404252 C -1.524689 -4.355239 -0.603353 H 3.858604 -0.849039 1.262676 C 0.004912 -5.984781 6.514083 H -0.753435 -6.635293 6.924783 C 2.845170 -0.089040 0.105219 C 2.909939 -0.786569 1.312381 C 0.571157 -4.131571 5.074137 C -0.393875 -4.972783 5.638459 H 1.555973 0.499050 -1.520367 C 1.633705 -0.017729 -0.576487 C 1.764920 -1.310568 1.882426 H 1.787197 -1.795654 2.847005 C -3.935440 -4.291843 -2.052664 O 0.232283 -3.117394 4.221365 C -2.667325 -3.740418 -0.076081 H -1.025200 -1.657683 -1.143057 O -2.168359 -4.812078 3.928785 C 0.486068 -0.598295 -0.038869 H -4.872282 -4.262294 -2.587770 C 0.547960 -1.186779 1.224524 H -4.550215 -5.544215 5.800269 C -1.853778 -4.765744 5.320540 H 3.368950 1.614871 3.590565 C -3.855711 -3.719570 -0.787248 H -0.667978 -0.046687 -1.760435 C -0.769762 -0.637335 -0.853925 O -2.636145 -3.130654 1.162358 H 5.551504 6.187082 -0.686566 O -0.598893 -1.643631 1.831320 H 4.093821 4.407773 0.268272 C 2.922244 1.569473 3.507460 H 2.199182 2.579673 1.608785 C 4.533208 6.061622 -1.027448 C 3.721672 5.073188 -0.499281 H -2.173047 -3.805739 5.748905 C 1.648317 2.103673 2.406926 C 1.571226 0.883216 4.485513 H -4.718545 -3.241623 -0.342879 O 4.037010 6.930185 -1.999455 C 1.926214 -0.117366 -0.146302 O 1.648946 3.908343 -0.413599 C 2.407443 4.916934 -0.941302 H -4.325396 -2.929372 3.433099 O -2.537409 -1.859837 3.450603 C 0.267759 2.000189 2.296386 C 0.182619 0.837049 4.400919 H -1.683936 1.417693 -4.628167 C 2.723274 6.786360 -2.435932 O -0.355423 2.460448 1.159458 H 0.438300 4.640712 -2.970149 C 1.905361 5.777752 -1.923090 C -3.112443 -0.127925 -4.265789 H -0.440396 0.332328 5.152936 C -2.449612 1.059058 -3.952537 C -3.867911 -2.110514 3.988499 H -3.740231 -2.421416 5.022206 C -0.480178 1.427781 3.325995 H -1.130870 2.714057 -1.242022 H -4.606671 -1.539446 -3.611381 C -4.093456 -0.613808 -3.403845 H -1.294565 3.279966 -3.212149 H 2.310431 7.451931 -3.180197 C -2.741093 1.755199 -2.787177 O 4.98104 5.597776 -2.433607 C -1.962629 2.986251 -2.406347 O -4.597317 -0.928905 1.501532

Table S2 xyz data of the optimized geometries of (3)₃ and 3(dmso)₂.

(3) ₃	3(dmso) ₂
183 Energy = -4346.914748093323 Sn 4.398955 1.016059 0.825469 Sn 3.478992 1.406942 -2.387865 O 2.914088 0.093616 -3.773757 C 2.724637 0.323231 -5.092663 C 2.726871 -0.794008 -5.961659 C 2.982906 -2.213468 -5.432469 C 1.830595 -2.617078 -4.490824 C 3.051156 -3.247111 -6.566206 H 2.111831 -3.330930 -7.114278 H 3.272723 -4.224932 -6.136672 H 3.845862 -3.012671 -7.276086 C 4.330409 -2.291147 -4.691853 H 4.493564 -3.307578 -4.326469 H 5.147450 -2.038921 -5.366047 H 4.370447 -1.619314 -3.843301 H 2.022122 -3.602617 -4.059924 H 1.717800 -1.903311 -3.679096 H 0.887122 -2.659877 -5.037482 C 2.421555 -0.559764 -7.296923 H 2.388963 -1.395239 -7.980774 C 2.168295 0.708241 -7.824305 H 2.772310 0.668182 -9.893023 C 1.881391 0.869490 -9.292838 H 1.109402 0.171975 -9.622549 H 1.540136 1.878712 -9.523848 C 2.214262 1.787148 -8.960200 H 2.043182 2.789702 -7.332087 C 2.463746 1.614735 -5.595886 C 2.308899 2.807430 -4.693894 H 1.429338 2.725295 -4.060120 H 2.252178 3.721299 -5.276067 O 3.438129 2.967431 -3.771717 O 6.467486 1.788787 -5.799482 C 6.870224 0.512669 -5.550820 C 7.205966 -0.300313 -6.655879 C 7.073693 0.214792 -8.095007 C 7.384796 -0.876389 -9.131034 H 8.412764 -1.236564 -9.070063 H 6.714799 -1.730925 -9.025747 H 7.241113 -0.460926 -10.129334 H 4.940810 -0.145164 -8.306752 C 5.636034 0.690974 -8.378576 H 5.573692 1.102659 -9.388854 H 8.031576 1.739324 -9.320803 C 8.084300 1.362477 -8.296509 H 9.099759 1.003740 -8.117750 H 7.889754 2.186766 -7.615536 H 5.310666 1.457488 -7.685924 C 7.738189 -1.557342 -6.383379 H 8.029251 -2.193364 -7.206232 C 7.925931 -2.048265 -5.092178 H 10.977379 -0.6466301.189902 C 8.480871 -3.434364 -4.891176 H 9.349004 -3.606811 -5.529423 H 7.738428 -4.193437 -5.150851 H 8.785046 -3.603532 -3.858238 C 7.551353 -1.238302 -4.030825 H 7.672542 -1.592860 -3.015021 C 7.024345 0.035064 -4.242110 C 6.714448 0.898462 -3.051471 H 6.687208 0.305867 -2.142701 H 7.474996 1.670904 -2.915486 O 5.448293 1.596893 -3.167056 Sn 5.338310 3.000676 -4.730805 O 6.729552 4.248723 -4.053895 C 6.577550 5.606676 -4.111924 C 7.258611 6.413849 -3.180023 C 8.344908 5.839177 -2.260363 C 9.407800 5.104346 -3.101485 H10.168069 4.680011 -2.441579 H 8.970550 4.298239 -3.683341 H 9.901111 5.795942 -3.786937 C 7.738447 4.866843 -1.241668 H 7.259895 4.026218 -1.734525 H 7.004092 5.383086 -0.621632 H 8.518604 4.479662 -0.587055 C 9.069207 6.937300 -1.472430 H 9.853069 6.479156 -0.868082 H 8.395624 7.467064 -0.795460 H 9.540100 7.665193 -2.134391 C 6.941571 7.772203 -3.174422 H 7.414573 8.413904 -2.446407 C 6.039430 8.352604 -4.064258 C 5.649310 9.800272 -3.926754 H 4.841993 9.922740 -3.199285 H 6.485830 10.408553 -3.578955 H 5.295203 10.210445 -4.873018 C 5.520135 7.550201 -5.072449 H 4.891621 7.985648 -5.841158 C 5.799915 6.187791 -5.126525 C 5.370590 5.374091 -6.323119 H 6.264744 5.040176 -6.864647	81 Energy = -2555.2512102650 C 1.128465 2.124082 11.921415 H 0.887623 1.633276 10.967827 H 0.189080 2.238873 12.470401 C 2.062271 1.229224 12.701980 C 1.684801 0.664882 13.914767 H 0.704582 0.895220 14.319137 C 2.532580 -0.195528 14.603789 C 3.778065 -0.473321 14.038314 H 4.425762 -1.150097 14.577090 C 4.220045 0.081618 12.835444 C 3.332726 0.953574 12.159313 C 2.138687 -0.793622 15.930734 H 2.515924 -1.812246 16.037037 H 1.054604 -0.824360 16.046253 H 2.537717 -0.215231 16.769900 C 5.610546 -0.238616 12.262963 C 5.470769 -0.868063 10.859981 H 6.458261 -1.109213 10.459280 H 4.976814 -0.183467 10.176033 H 4.890448 -1.791928 10.909908 C 6.379808 -1.236629 13.143222 H 7.351926 -1.439209 12.690935 H 5.854700 -2.188667 13.237331 H 6.560791 -0.844000 14.145635 C 6.455420 1.049953 12.171225 H 7.456777 0.811090 11.803656 H 6.561569 1.507990 13.157168 H 6.014145 1.780782 11.500241 C 4.301978 3.033958 15.147718 H 3.973665 2.040607 14.847582 H 3.927355 3.269119 16.143748 H 5.386903 3.110902 15.100291 C 4.316788 5.721449 14.576612 H 4.025796 6.496304 13.870198 H 5.399958 5.614093 14.597731 H 3.919966 5.945391 15.566050 O 1.636398 3.428540 11.684729 C 3.680142 1.517768 10.989075 O 4.365166 3.929709 12.687298 S 3.578520 4.190097 13.977631 Sn 3.397091 3.535959 10.752953 O 5.158983 3.643866 9.823288 C 3.112799 5.553676 10.515170 O 2.431385 3.142084 8.817615 C 5.667338 4.948650 9.589433 C 3.463172 6.118174 9.345967 S 3.220775 2.880508 7.529123 H 5.905135 5.438591 10.544238 H 6.608411 4.834690 9.043147 C 4.735377 5.843602 8.806829 C 2.577020 6.989346 8.667229 C 2.501261 4.036902 6.356871 C 2.482513 1.349610 6.929090 C 5.116063 6.408755 7.595428 C 3.022113 7.544948 7.465821 C 1.184429 7.308158 9.235503 H 2.829711 5.030076 6.657432 H 2.878221 3.800979 5.361908 H 1.416160 3.960953 6.401554 H 2.770929 0.574921 7.636747 H 1.399507 1.457934 6.904999 H 2.881794 1.124725 5.940858 H 6.097706 6.179358 7.193974 C 4.269628 7.268623 6.904118 H 2.375431 8.221246 6.925265 C 1.319332 7.938080 10.638752 C 0.416683 8.305074 8.352667 C 0.340591 6.018747 9.325104 C 4.667161 7.867855 5.578771 H 0.330383 8.178369 11.036368 H 1.811823 7.254141 11.324405 H 1.898911 8.862486 10.590362 H -0.557102 8.506510 8.801859 H 0.940882 9.257754 8.260047 H 0.239357 7.912043 7.349757 H -0.662144 6.256732 9.689459 H 0.237991 5.560207 8.339034 H 0.780606 5.288693 9.997751 H 4.290393 8.886647 5.472387 H 5.751555 7.898521 5.466208 H 4.270283 7.290319 4.738018

Table S3 Calculated chemical shifts of tin atoms of the optimized geometries of **(1)**₄, **(2)**₄, **(3)**₃ and **3**(dms_o)₂ being referenced on the chemical shift of tetracyclohexylstannane ($\delta = -97.3$ ppm).

	(RI) TPSS/def2-TZVPP (Sapporo-DZP-2012/Autoaux for Sn)				(RI) M06L/def2-QZVPP (Sapporo-DZP-2012/Autoaux for Sn)			
	Sn1	Sn2	Sn3	Sn4	Sn1	Sn2	Sn3	Sn4
(1) ₄	-594	-651	-649	-595	-751	-798	-796	-749
(2) ₄	-598	-657	-656	-599	-752	-810	-807	-754
(3) ₃	-545	-689	-534		-698	-834	-691	
3 (dms _o) ₂	-650				-801			