Electronic supplementary information (ESI)

Tables

Table S1 Overall and stepwise protonation constant of TEA (25 °C, 0.10 M KNO_3; T = TEA, H = H^+)

Stoichiometry				log *K*
T	H	log β[a]	Stepwise constant, *K*	*T*[b]
1	1	7.81	[TH]/[T][H]	7.81 (7.8)

[a] Estimated error = ± 0.02

[b] Values in parentheses are literature values.

Table S2 Overall formation constants (β) (Cu(II)-TEA) for the interaction of Cu(II) with TEA (M= Cu^{2+}, T = TEA, H = H^+; *I* = 0.10 M (KNO_3), 25.0 °C)

Stoichiometry					log *K*
M	T	H	log *β*[a]	Stepwise constant, *K*	*T*[b]
1	1	0	3.85(3)	[MT]/[M][T]	3.85 (4.07)
1	1	-1	-1.74(1)	[MT]/[MTOH][H]	5.59 (5.41)
1	1	-2	-9.21(1)	[MTOH]/[$MT(OH)_2$][H]	7.47
1	1	-3	-20.52(2)	[$MT(OH)_2$]/[$MT(OH)_3$][H]	11.31

[a] Estimated error = ± 0.02

[b] Values in parentheses are literature values

Table S3: Overall formation constants (β) (Nd(III)-TEA) for the interaction of Nd(III) with TEA (M= Nd^{3+}, T = TEA, H = H^+; I = 0.10 M (KNO_3), 25.0 °C)

Stoichiometry					log K
M	T	H	log β[a]	Stepwise constant, K	T
1	1	0	2.23	[MT]/[M][T]	2.23
1	1	-1	-5.41	[MT]/[MTOH][H]	7.64

[a] Estimated error = ± 0.06

Table S4: Overall and stepwise protonation constant of Citric Acid (25 °C, 0.10 M KNO_3; CA = Citrate, H = H^+)

Stoichiometry				log K
CA	H	log β[a]	Stepwise constant, K	CA[b]
1	1	5.72	[HCA]/[H][CA]	5.72 (5.69)
1	2	10.10	[H_2CA]/[H][HCA]	4.38 (4.35)
1	3	13.05	[H_3CA]/[H][H_2CA]	2.95 (2.87)

[a] Estimated error = ± 0.02

[b] Values in parentheses are literature values.

Table S5: Overall formation constants (β) (Cu(II)-CA) for the interaction of Cu(II) with CA (M= Cu^{2+}, CA = CA, H = H^+; I = 0.10 M (KNO_3), 25.0 °C)

Stoichiometry					log K
M	CA	H	log β[a]	Stepwise constant, K	T[b]
1	1	1	9.26(3)	[MHCA]/[M][HCA]	3.36 (3.42)
1	1	0	5.90(1)	[MCA]/[M][CA]	5.90 (5.90)
1	1	-1	1.60(2)	[MCA]/[MTCA][H]	4.30 (4.34)

[a] Estimated error = ± 0.02

[b] Values in parentheses are literature values (20,0 °C)

Table S6: Overall formation constants (β) (Nd(III)-CA) for the interaction of Nd(III) with CA (M= Nd^{3+}, CA = CA, H = H^{+}; I = 0.10 M (KNO_3), 25.0 °C)

Stoichiometry					log K
M	CA	H	log β[a]	Stepwise constant, K	T
1	1	1	10.36(3)	[MHCA]/[MCA][H]	3.12
1	1	0	7.24(1)	[MCA]/[M][CA]	7.24
1	2	0	11.49(2)	$[MCA_2]/[M][CA]^2$	11.49
3	4	0	31.82(9)	$[M_3CA_4]$ /$[M]^3[CA]^4$	31.82
3	4	-2	18.31(9)		
3	4	-4	2.88(6)		
3	4	-5	-8.28(14)		

[a] Standard deviations in parentheses.

Table S7: Characteristic IR frequencies

Group	Band (cm^{-1})	Intensity	Remarks
$-CH_3$, $-CH_2-$	3100-2800	Medium	C-H stretching
	1430-1410	Medium	C-H deformations
$-CH_2OH$	3400-3200	Strong	Polymeric OH
	1300-1200	Medium	OH bending
	1100-1000	Strong	C-O stretch
-COOH	3500-3200	Strong	-
	1700-1550	Strong	
	1350-1340	Strong	
	950-825	Medium	
R_3N	1310-1360	Strong	C-N stretch

Figures

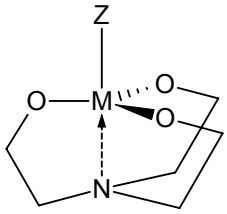

Fig. S1: Metal–TEA complex

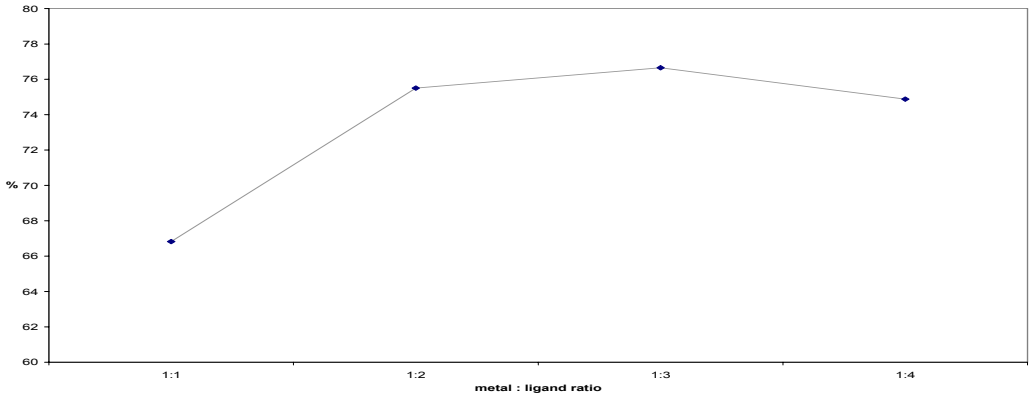

Fig. S2: Percentage $CuL(OH)^{+}$ as a function of the metal/ligand ratio.

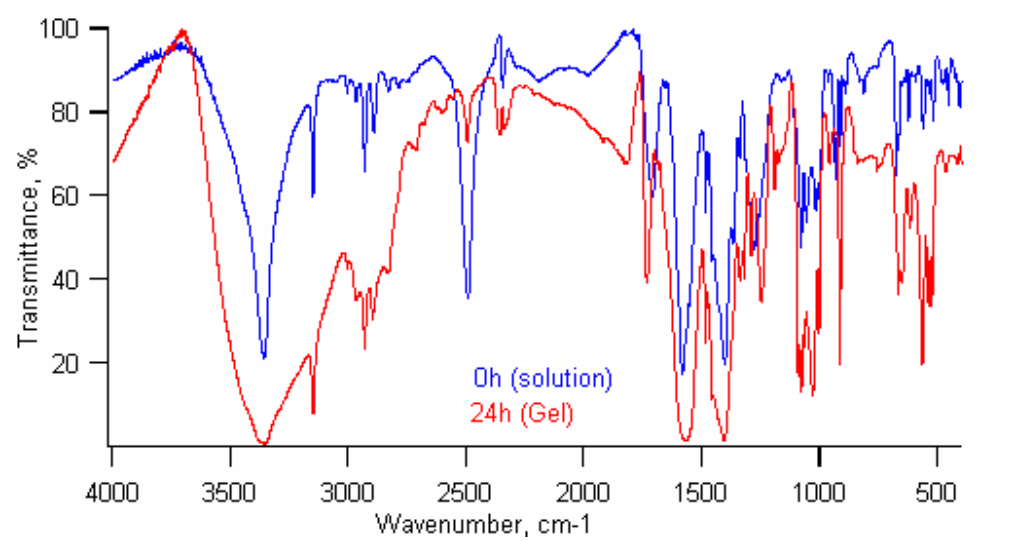

Fig. S3: IR spectrum of the acetate–TEA precursor solution (blue) and gel (red) after a drying time of 24 h at 60°C.

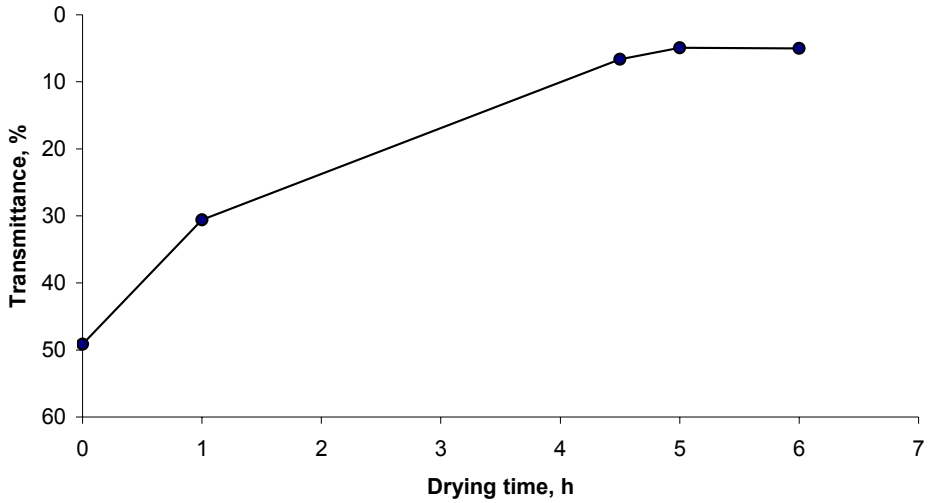

Fig. S4: Dependence of the observed intensity of absorption on the drying time.

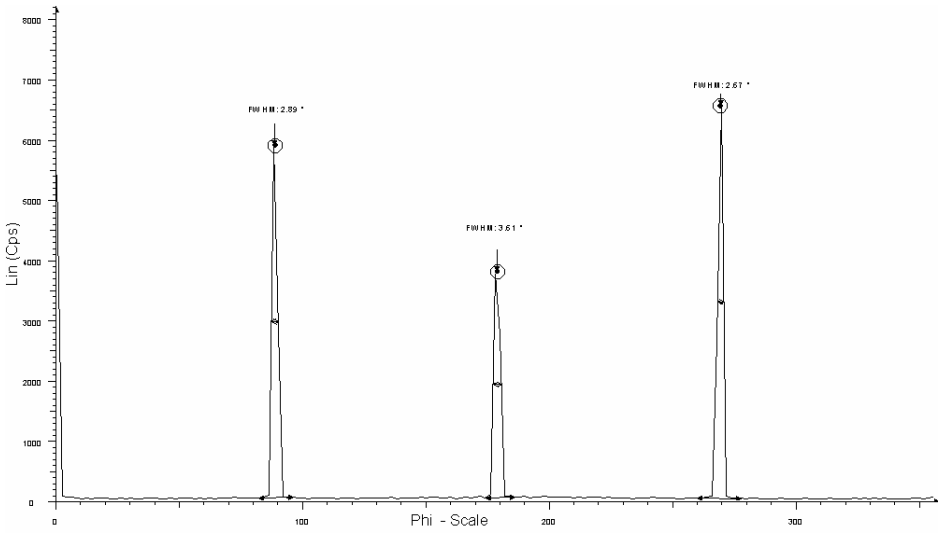

Fig. S5: *Phi*-scan of NBCO film