SUPPORTING INFORMATION

Section S1. Bond lengths [Å] and angles [º] for the compounds RPF-18-Pr, RPF-18-La and RPF-19-Nd .

Section S2. FT-IR Spectroscopy of compounds RPF-18-Pr, RPF-18-La and RPF-19-N .

Section S3. Experimental and Simulated Powder X-Ray Diffraction Patterns.

Section S4. Thermal Gravimetric Analysis.

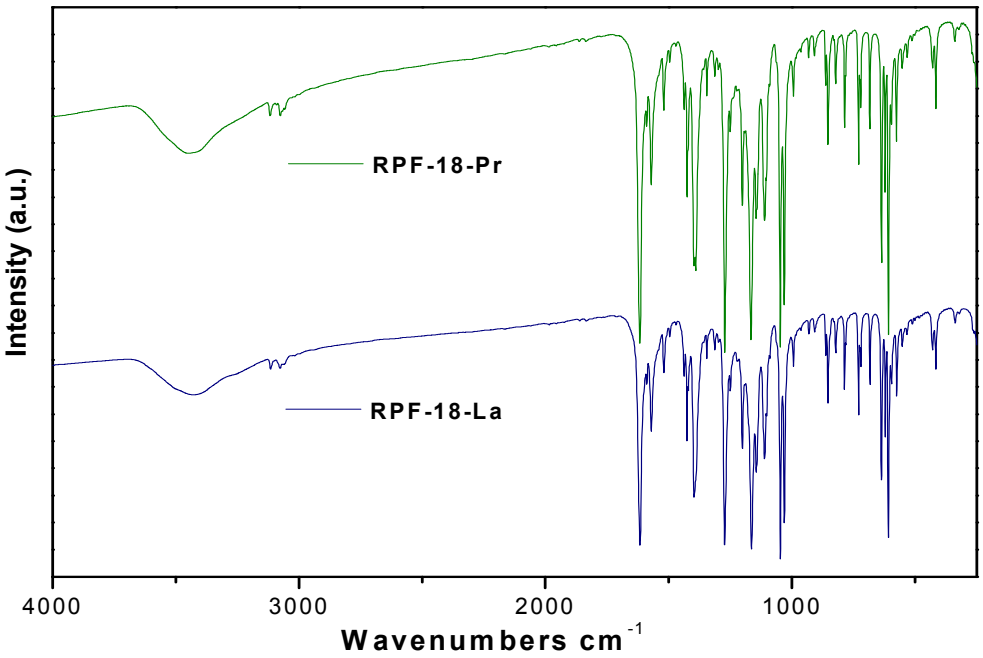
Section S5. X-ray powder patterns for all compounds after TG analysis.

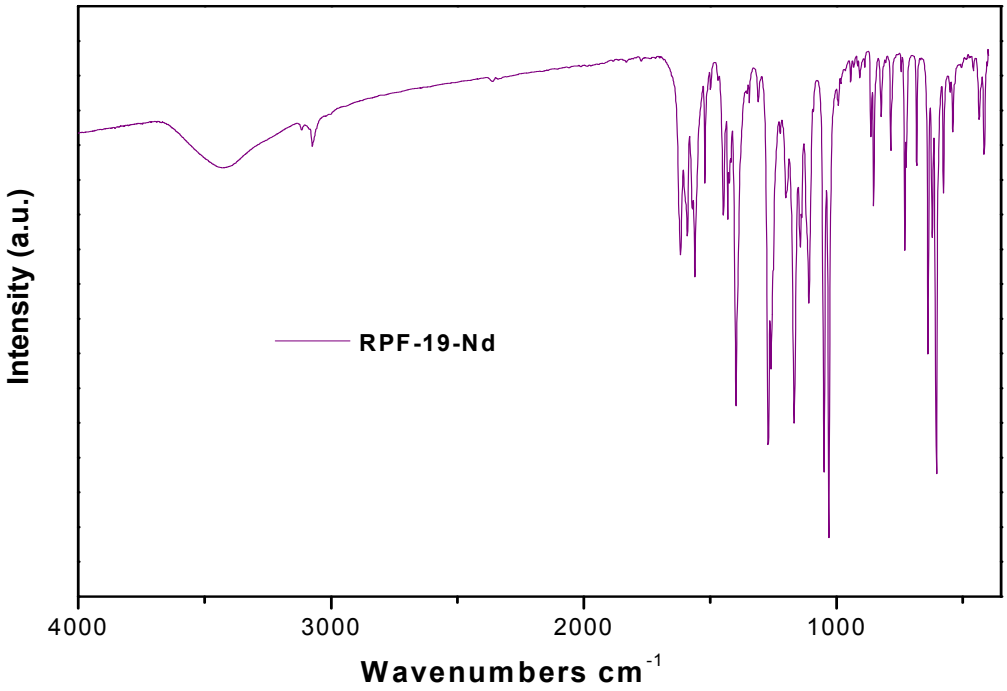
Section S6. X-ray powder patterns for RPF-18-Pr, RPF-18-La and RPF-19-Nd after catalytic studies.

Section S1. Bond lengths [Å] and angles [º] for the compounds RPF-18-Pr, RPF-18-La and RPF-19-Nd .

RPF-18-Pr		**RPF-18-La**		**RPF-19-Nd**	
Pr1-N1	2.6678(106)	La1-N1	2.6926(65)	Nd1-N1	2.6202(34)
Pr1-N2	2.7032(104)	La1-N2	2.7509(63)	Nd1-N2	2.6294(38)
Pr1-O1	2.5644(79)	La1-O1	2.6104(48)	Nd1-O1	2.5167(31)
Pr1-O2	2.5754(86)	La1-O2	2.5893(49)	Nd1-O2	2.5807(30)
Pr1-O4	2.4287(83)	La1-O4	2.4564(51)	Nd1-O4	2.4080(30)
Pr1-O5	2.4418(83)	La1-O5	2.4801(51)	Nd1-O6	2.4263(30)
Pr1-O7	2.3442(100)	La1-O7	2.3960(56)	Nd1-O7	2.3927(37)
Pr1-O8	2.3676(86)	La1-O8	2.4224(49)	Nd1-O8	2.4138(30)
				Nd1-O7#	3.0770(30)
S1-O1	1.4689(88)	S1-O1	1.4659(51)	S1-O1	1.4774(33)
S1-O2	1.4659(91)	S1-O2	1.4776(52)	S1-O2	1.4680(36)
S1-O3	1.4319(91)	S1-O3	1.4336(56)	S1-O3	1.4351(32)
S2-O4	1.4530(86)	S2-O4	1.4613(55)	S2-O4	1.4661(36)
S2-O5	1.4659(88)	S2-O5	1.4618(54)	S2-O5	1.4339(33)
S2-O6	1.4187(106)	S2-O6	1.4293(61)	S2-O6	1.4625(30)
N2 - Pr1- N1	61.24(0.30)	N2 - La1- N1	60.27(0.18)	N2 - Nd1- N1	62.45(0.11)
O7 - Pr1 - O5	75.74(0.30)	O7 - La1 - O5	75.84(0.18)	O7 - Nd1 – O6	74.909(0.105)
O2 - Pr1 - O1	54.98(0.27)	O2 - La1 - O1	54.39(0.16)	O2 - Nd1 - O1	55.54(0.09)
O3 - S1 - O1	114.78(0.55)	O3 - S1 - O1	114.54(0.33)	O3 - S1 - O1	113.74(0.20)
O2 - S1- O1	107.88(0.51)	O2 - S1- O1	107.67(0.29)	O2 - S1- O1	107.53(0.19)
O3-S1-O2	113.51(0.54)	O3-S1-O2	114.74(0.33)	O3-S1-O2	114.44(0.20)
O5-S2-O6	113.79(0.55)	O5-S2-O6	113.77(0.32)	O5-S2-O6	114.028(0.225)
O5-S2-O4	110.469(557)	O5-S2-O4	110.664(308)	O5-S2-O4	113.46(0.20)
O4-S2-O6	114.193(552)	O4-S2-O6	113.533(336)	O4-S2-O6	110.140(0.183)

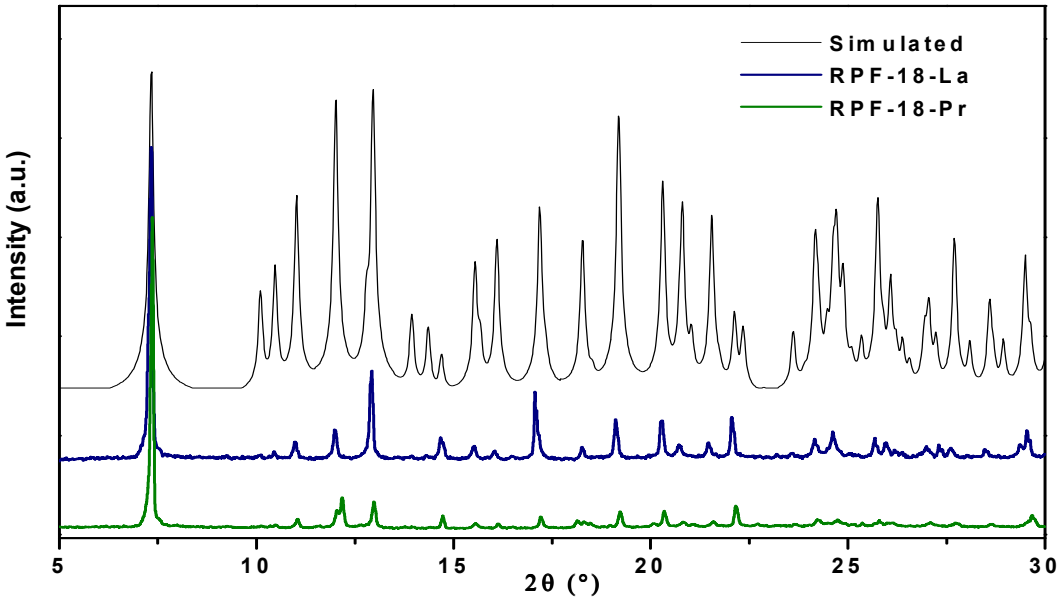
Section S2. FT-IR Spectroscopy of compounds RPF-18-Pr, RPF-18-La and RPF-19-Nd .

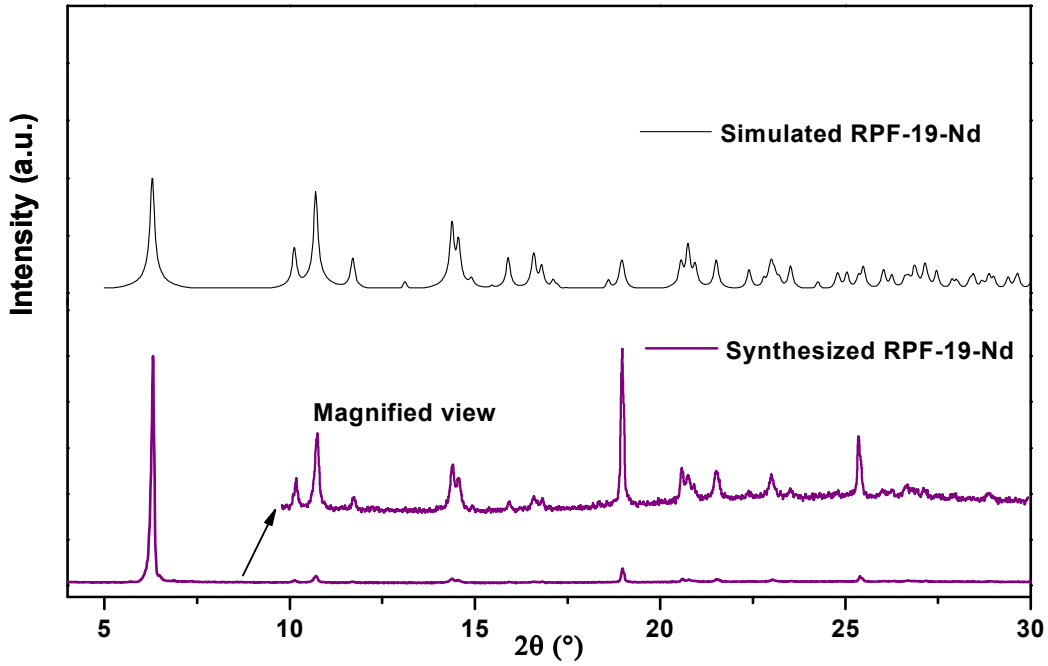




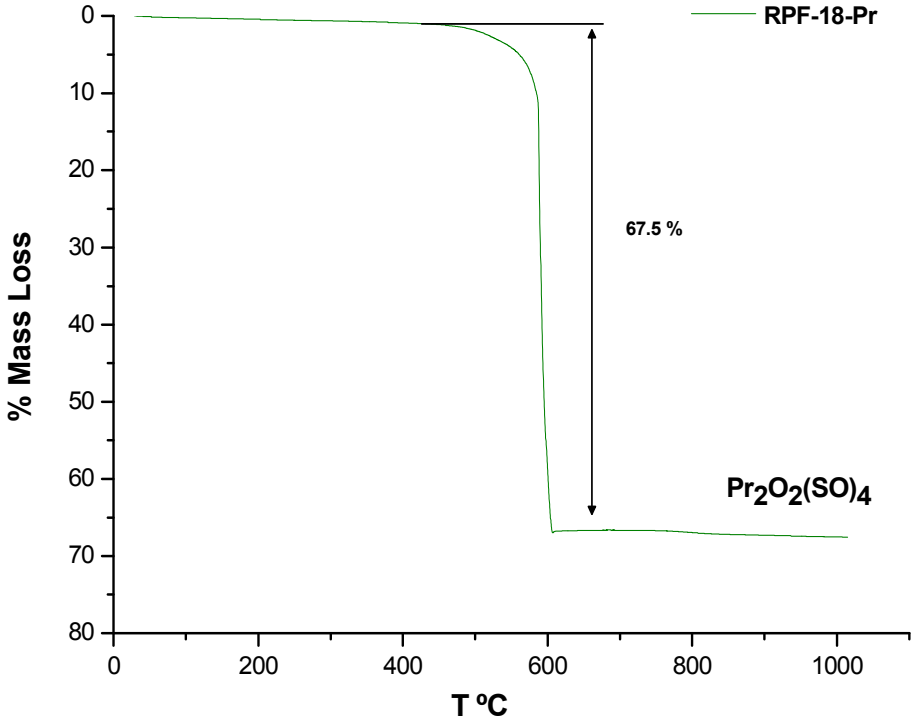
Section S3. Experimental and Simulated Powder X-Ray Diffraction Patterns.

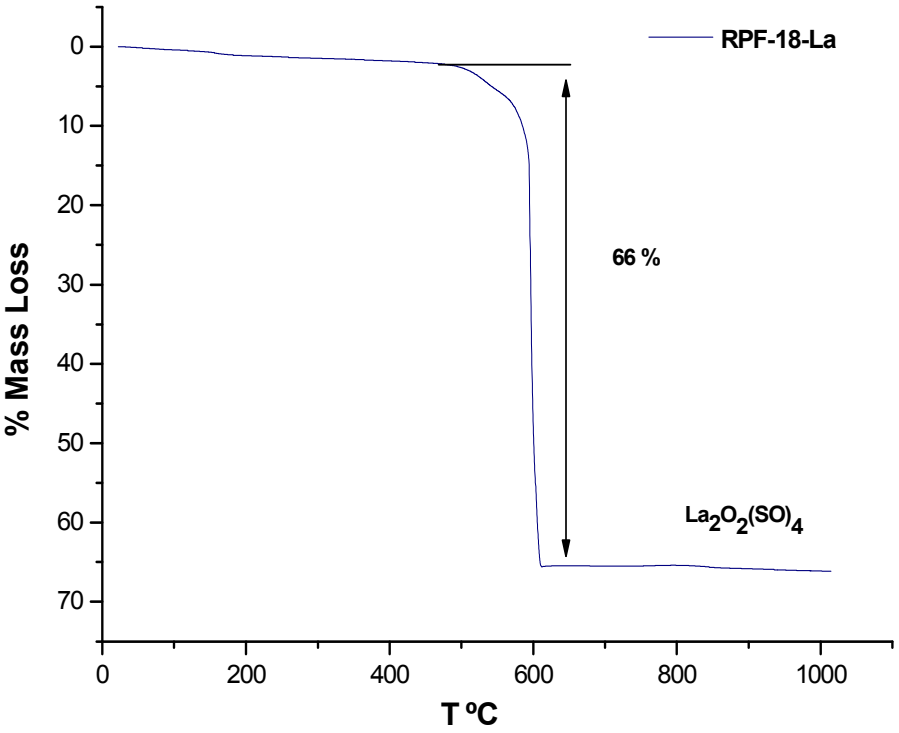
Powder X-ray diffraction (PXRD) measurements were performed with a Bruker D8 diffractometer in the θ-θ mode using nickel-filtered Cu Kα1 (λ =0.15406 nm) radiation. All samples were ground to ensure a sufficient dispersion in the bulk, and then mounted onto a glass slide fixed on a sample holder by dropping powders and then leveling the sample surface. The best counting statistics were achieved by using a scanning steps of 0.02° that were taken between 5 and 30° Bragg angles with an exposure time of 0.5 s per step. Comparison was made of the experimental PXRD patterns for synthesized compounds with the simulated patterns from single crystals X-Ray data.

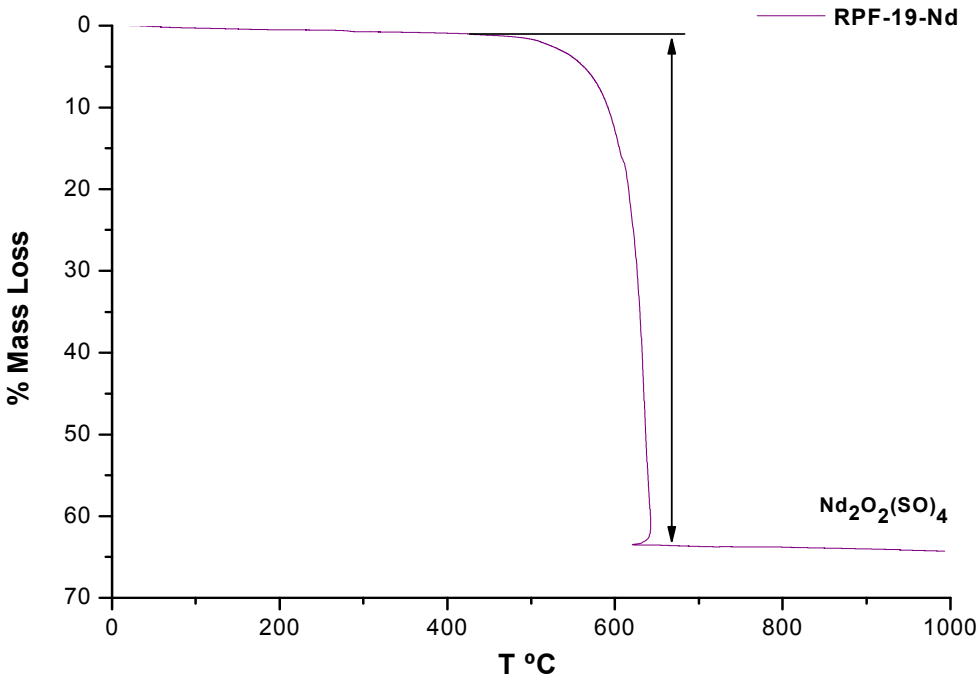




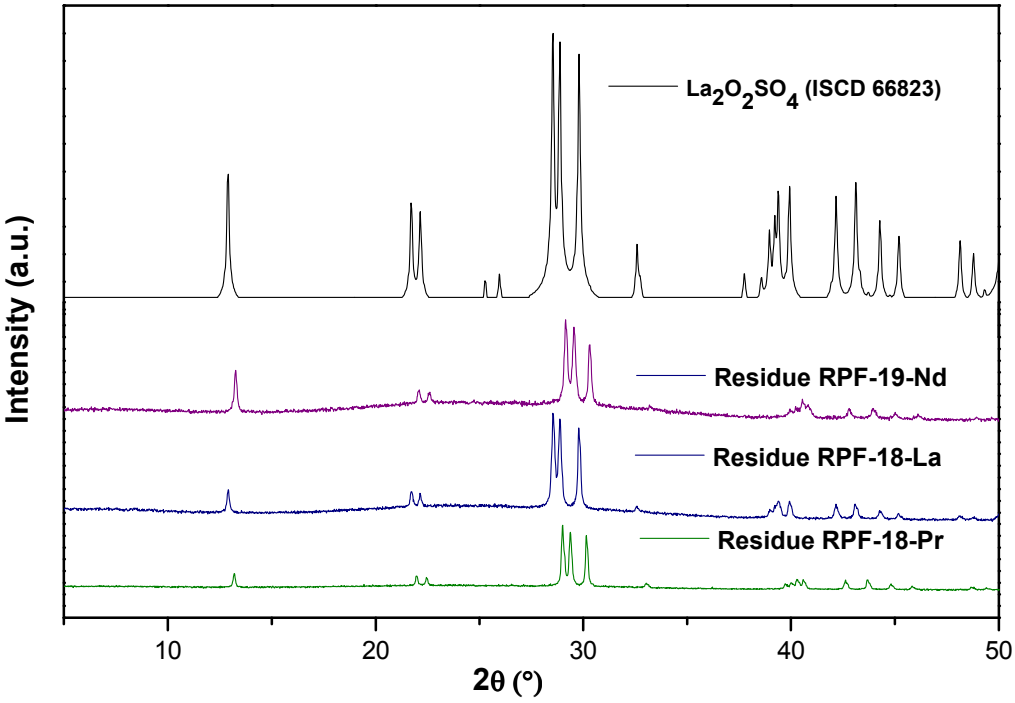
Section S4. Thermal Gravimetric Analysis.



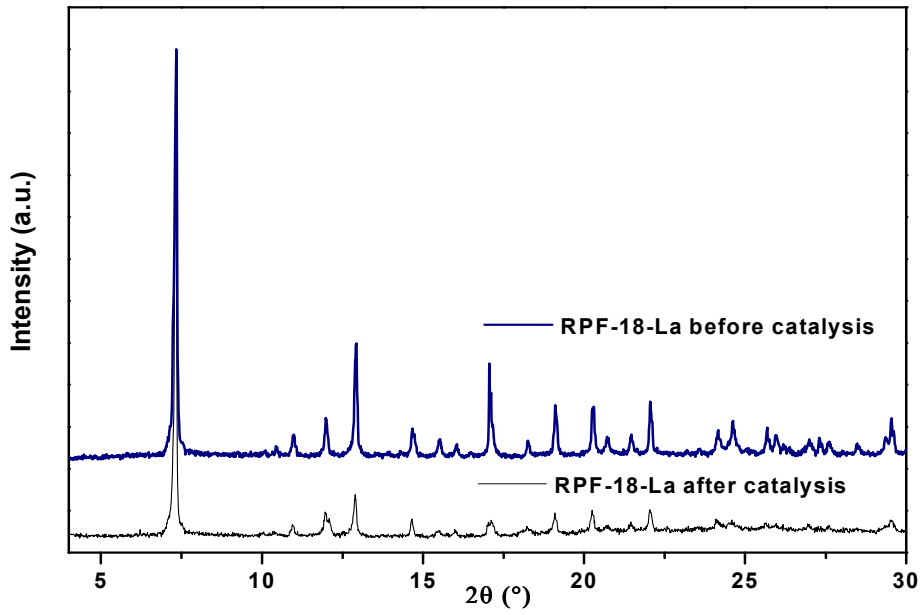


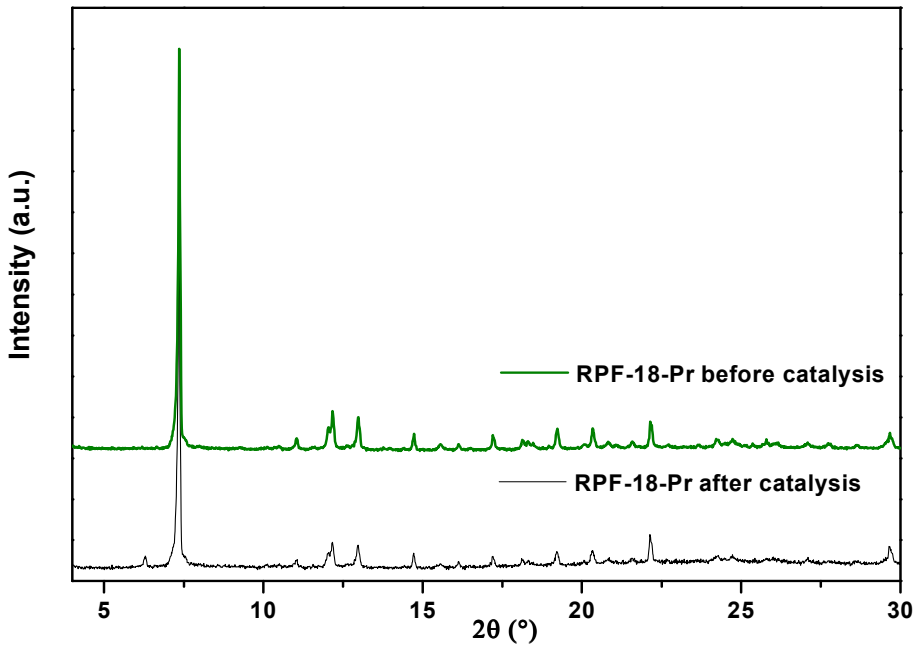

RPF-19-Nd
% Mass Loss
T ºC
0
10
20
30
40
50
60
70
0
200
400
600
800
1000
Nd2O2(SO)4

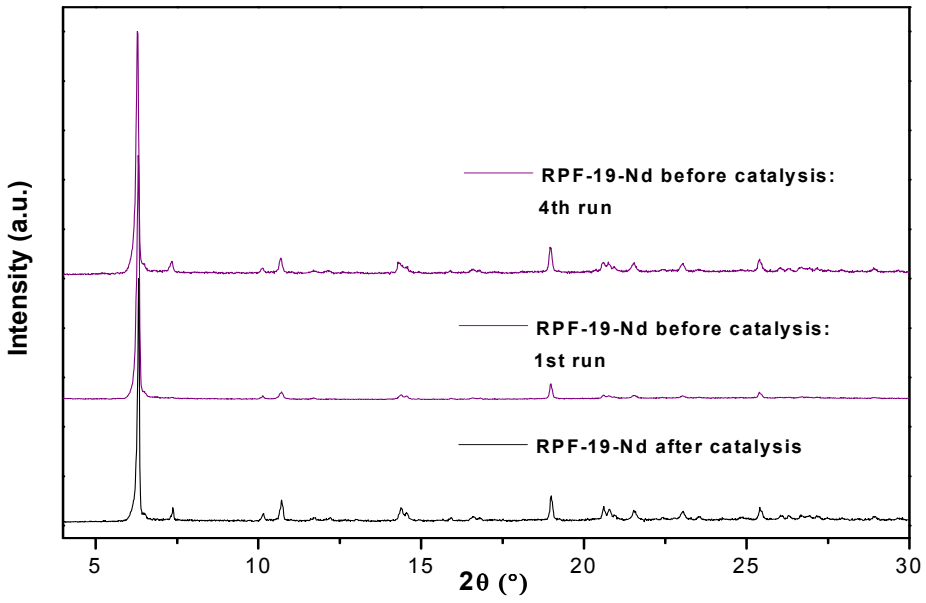
Section S5. X-ray powder patters for all compounds after TG analysis.



Section S6. X-ray powder patterns for RPF-18-Pr, RPF-18-La and RPF-19-Nd after catalytic studies.






Intensity (a.u.)
RPF-19-Nd before catalysis:
4th run
RPF-19-Nd before catalysis:
1st run
RPF-19-Nd after catalysis
5
10
15
20
25
30
2θ (°)