**SUPPORTING INFORMATION**

**Lanthanide coordination polymers with 1,2-phenylenediacetate.**

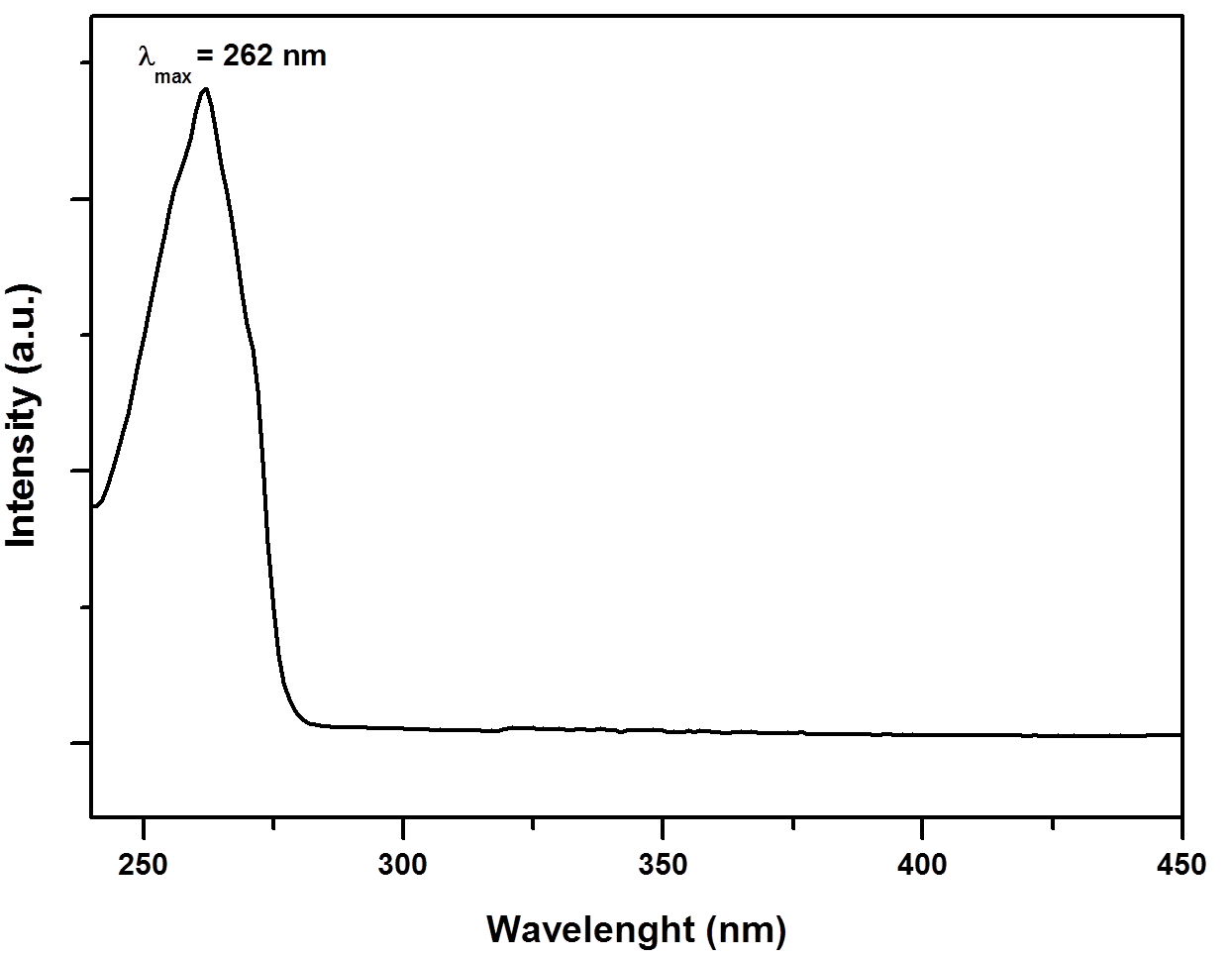
Insa Badianea,b, Stéphane Freslona, Yan Suffrena, Carole Daiguebonnea, Guillaume Calveza, Kevin Bernota, Magatte Camarab and Olivier Guilloua.

a INSA Rennes, UMR 6226 “Institut des Sciences Chimiques de Rennes”, F-35708 Rennes

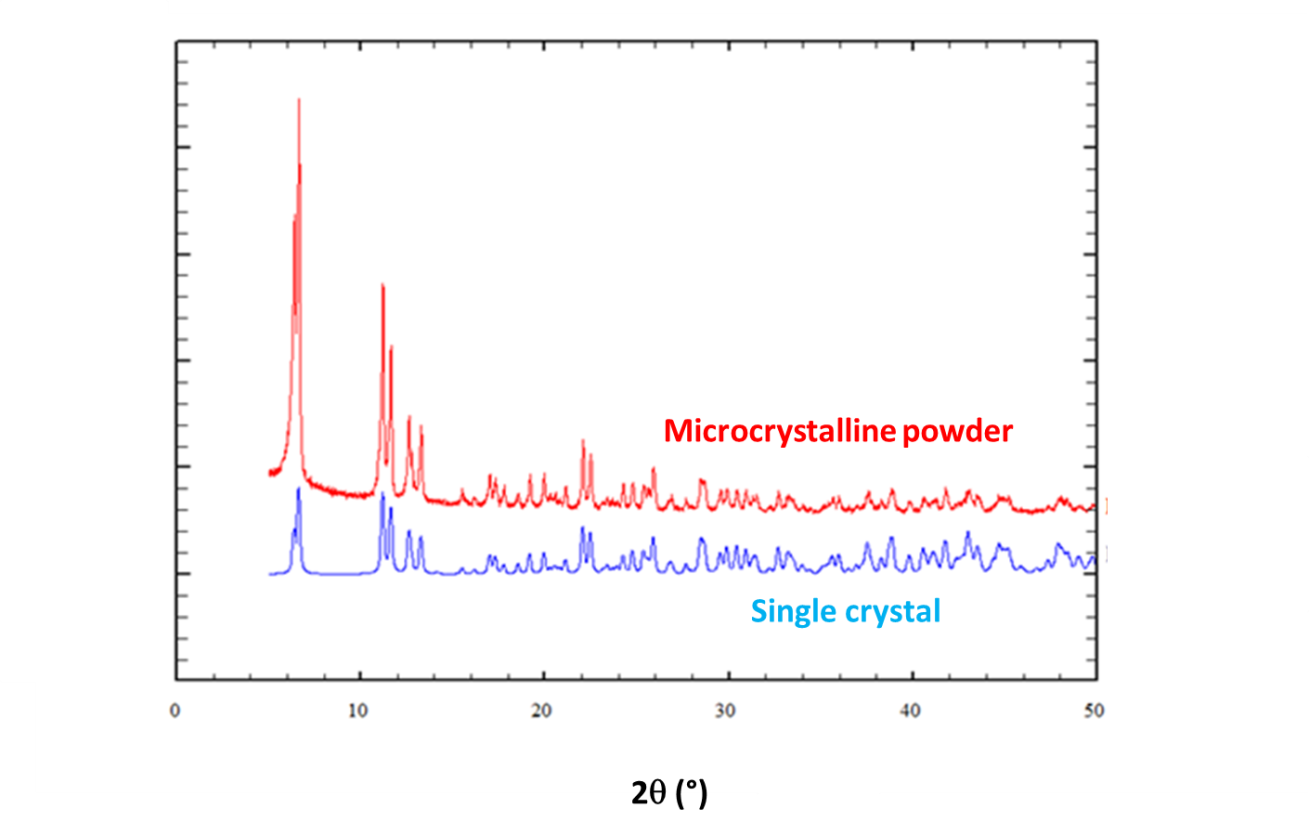
b Université Assane Seck de Ziguinchor, LCPM – Groupe "Matériaux Inorganiques: Chimie Douce et Cristallographie", BP. 523 Ziguinchor – Sénégal

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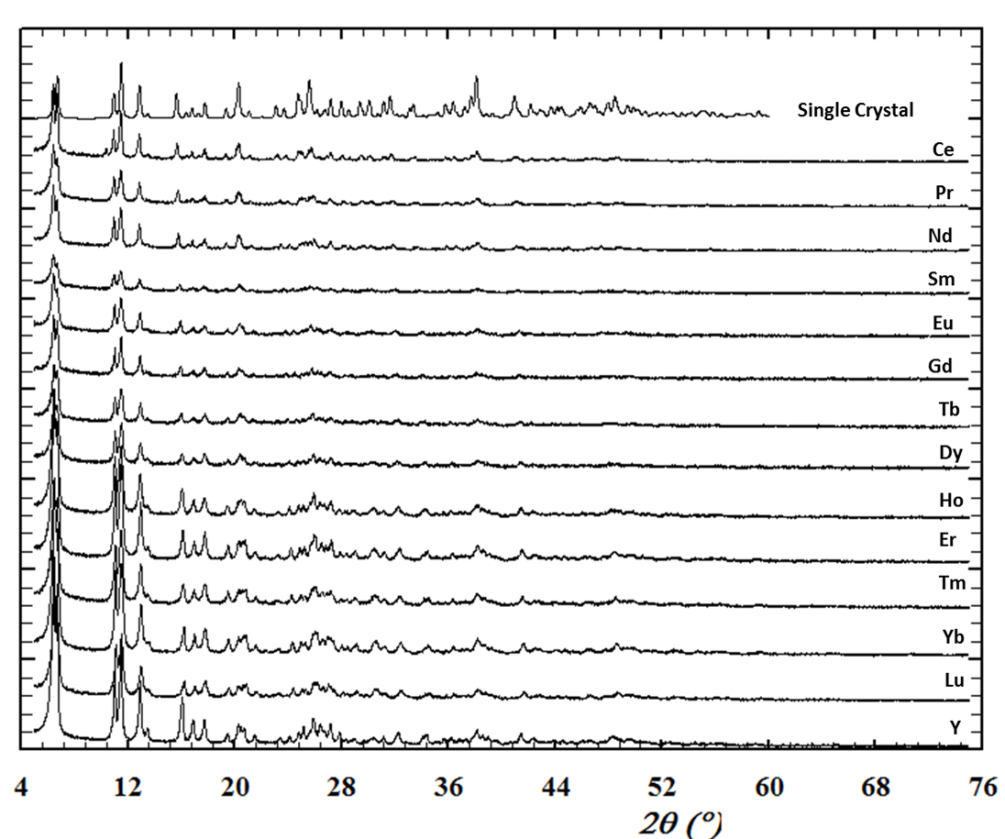
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| **Table S1.** Crystal and final structure refinement data already reported. | | | | | | | | | | | | |
| Molecular formula | Nd2C30O16H33 | | La2C30O16H33 | | | Tb2C30O16 H36 | Ho2C30O16H36 | Er2C30O16.5H33 | | Pr2C30O16.5H33 | | Dy2C30O16H32 |
| System | Monoclinic | | Monoclinic | | | Monoclinic | Monoclinic | Monoclinic | | Monoclinic | | Monoclinic |
| a (Å) | 26.2906 (18) | | 26.271 (14) | | | 26.2699 (4) | 26.317 (4) | 26.317 (3) | | 26.223 (7) | | 26.2718 (9) |
| b (Å) | 16.1172 (11) | | 16.149 (8) | | | 16.0274 (2) | 16.004 (3) | 16.1589 (19) | | 16.097 (4) | | 16.0042 (6) |
| c (Å) | 7.8327 (5) | | 7.966 (4) | | | 7.6724 (1) | 7.6263 (12) | 7.8459 (9) | | 7.852 (2) | | 7.6441 (3) |
| β (°) | 93.173 (5) | | 92.850 (9) | | | 93.345 (1) | 93.471 (2) | 93.124 (2) | | 93.031 (4) | | 93.389 (2) |
| V (Å3) | 3313.9 (4) | | 3375 (3) | | | 3224.87 (8) | 3206.1 (9) | 3331.6 (7) | | 3309.8 (15) | | 3208.41 (20) |
| Z | 4 | | 4 | | | 4 | 4 | 4 | | 4 | | 4 |
| Formula weight (g mol-1) | 937.04 | | 926.38 | | | 958.36 | 978.42 | 992.08 | | 939.38 | | 973.56 |
| Space group (No.) | C2/c (n°15) | | C2/c (n°15) | | | C2/c (n°15) | C2/c (n°15) | C2/c (n°15) | | C2/c (n°15) | | C2/c (n°15) |
| Dcalc (g cm-3) | 1.878 | | 1.823 | | | 1.97 | 2.027 | 1.978 | | 1.885 | | 2.01538 |
| µ (mm-1) | 3.173 | | 2.570 | | | 4.426 | 4.976 | 5.08 | | 2.99 | | 4.70 |
| R (%) | 1.75 | | 5.05 | | | 2.94 | 3.30 | 1.4 | | 1.9 | | 2.2 |
| RW (%) | 10.357 | | 13.315 | | | 8.04 | 12.4 | 11.3 | | 10 | | 5.5 |
| GoF | 1.053 | | 1.055 | | | 1.003 | 1.069 | 1.09 | | 1.081 | | 1.06 |
| N° CCDC | 953279 | | 952811 | | | 635048 | 635081 | 963497 | | 963495 | | 669663 |
| Reference | | 44 | | 44 | 47 | | 47 | 46 | 46 | | 45 | |



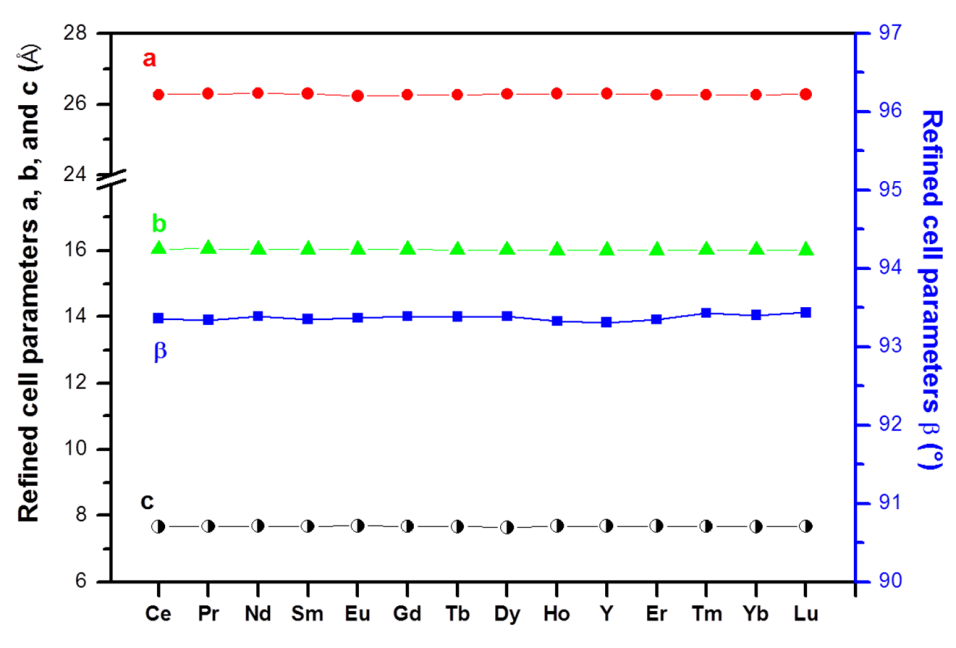
**Figure S1.** UV-vis absorption spectrum of an aqueous solution of Na2o-pda (c = 4.3 10-5 mol.L-1).



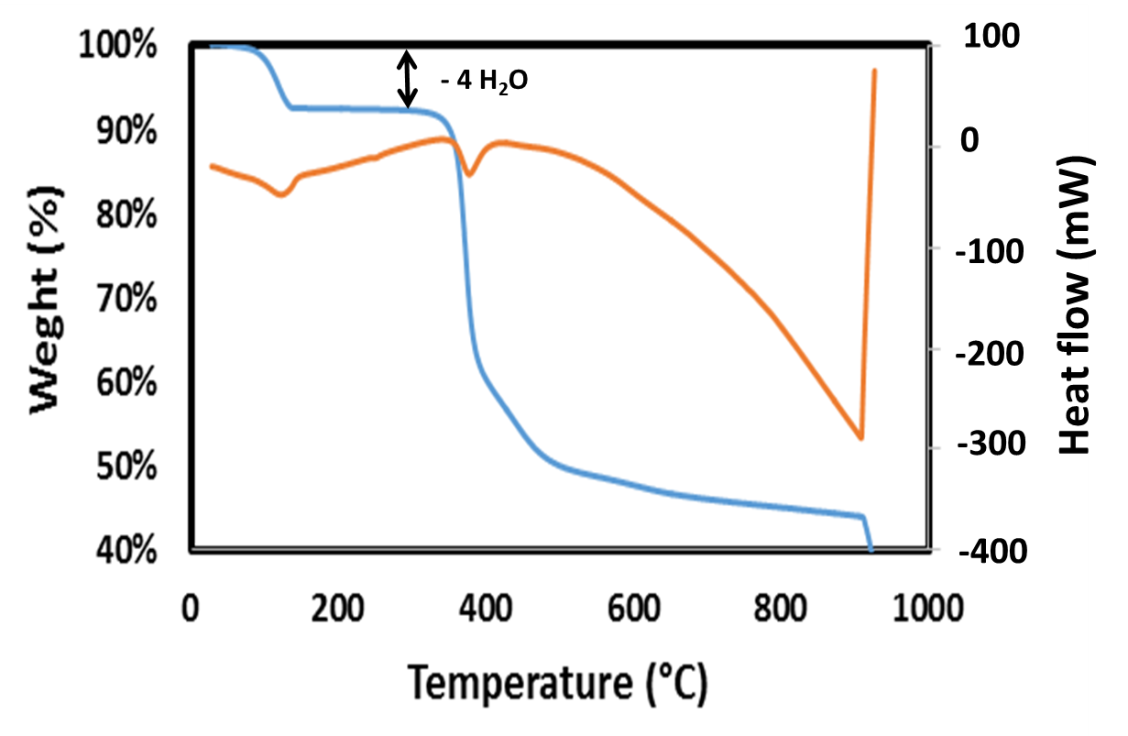
**Figure S2.** Experimental and simulated (on the basis of crystal structure) powder diffraction patterns of [La2(o-pda)3(H2O)4,4H2O]∞ (**1.**).



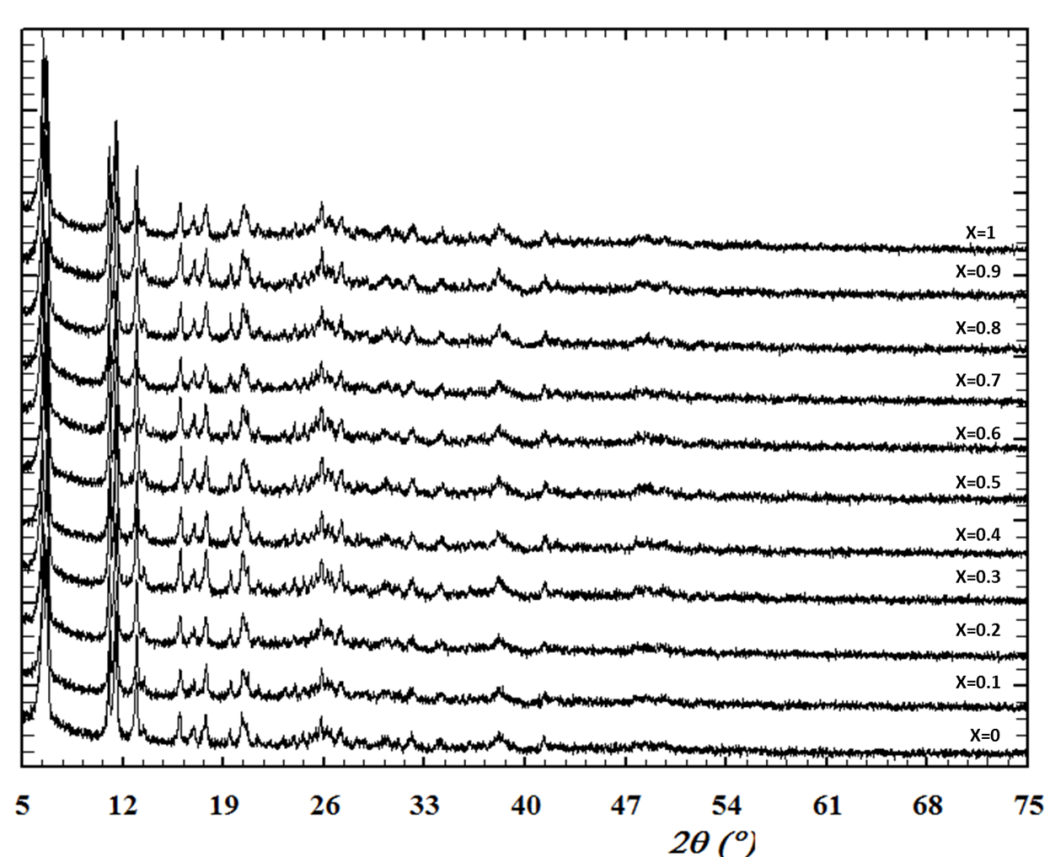
**Figure S3.** Experimental and simulated (on the basis of the crystal structure from reference [47]) powder X-ray diffraction patterns of microcrystalline compounds [Ln2(o-pda)3(H2O)2,2H2O]∞ for Ln = Ce-Nd, Sm-Lu and Y (**2**).



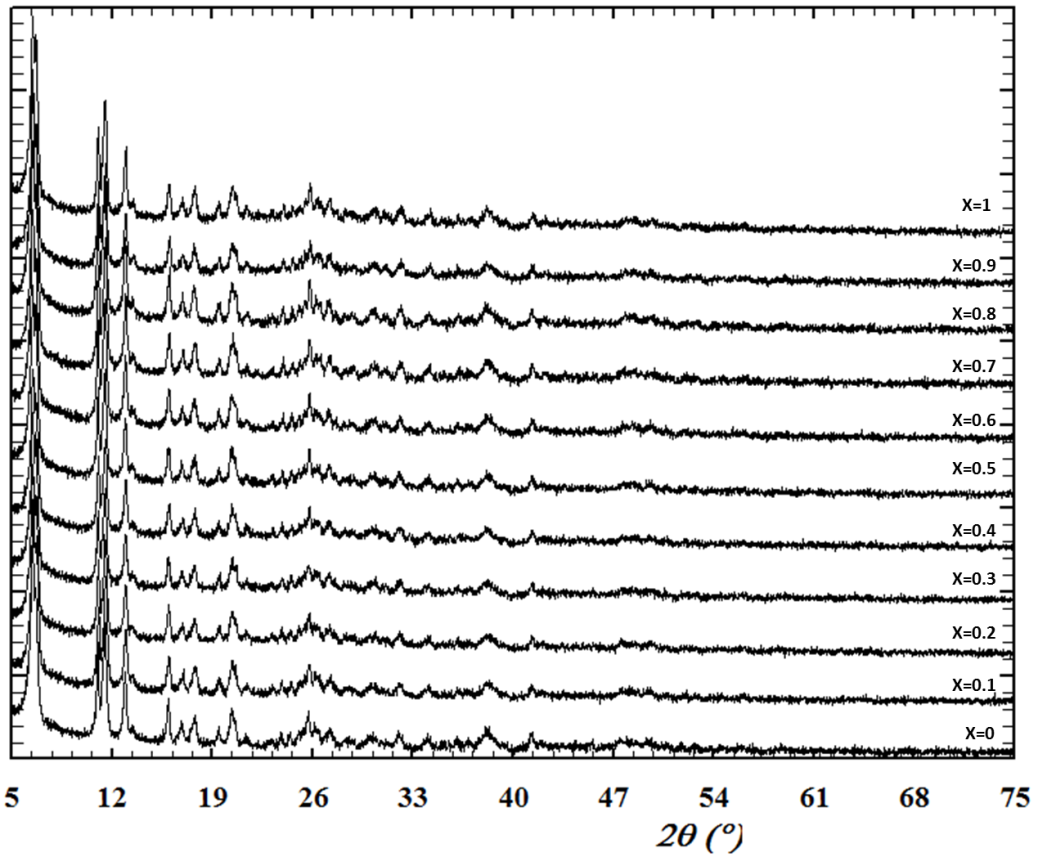
**Figure S4.** Refined cell parameters for microcrystalline compounds [Ln2(o-pda)3(H2O)2,2H2O]∞ for Ln = Ce-Nd, Sm-Lu and Y (**2**).



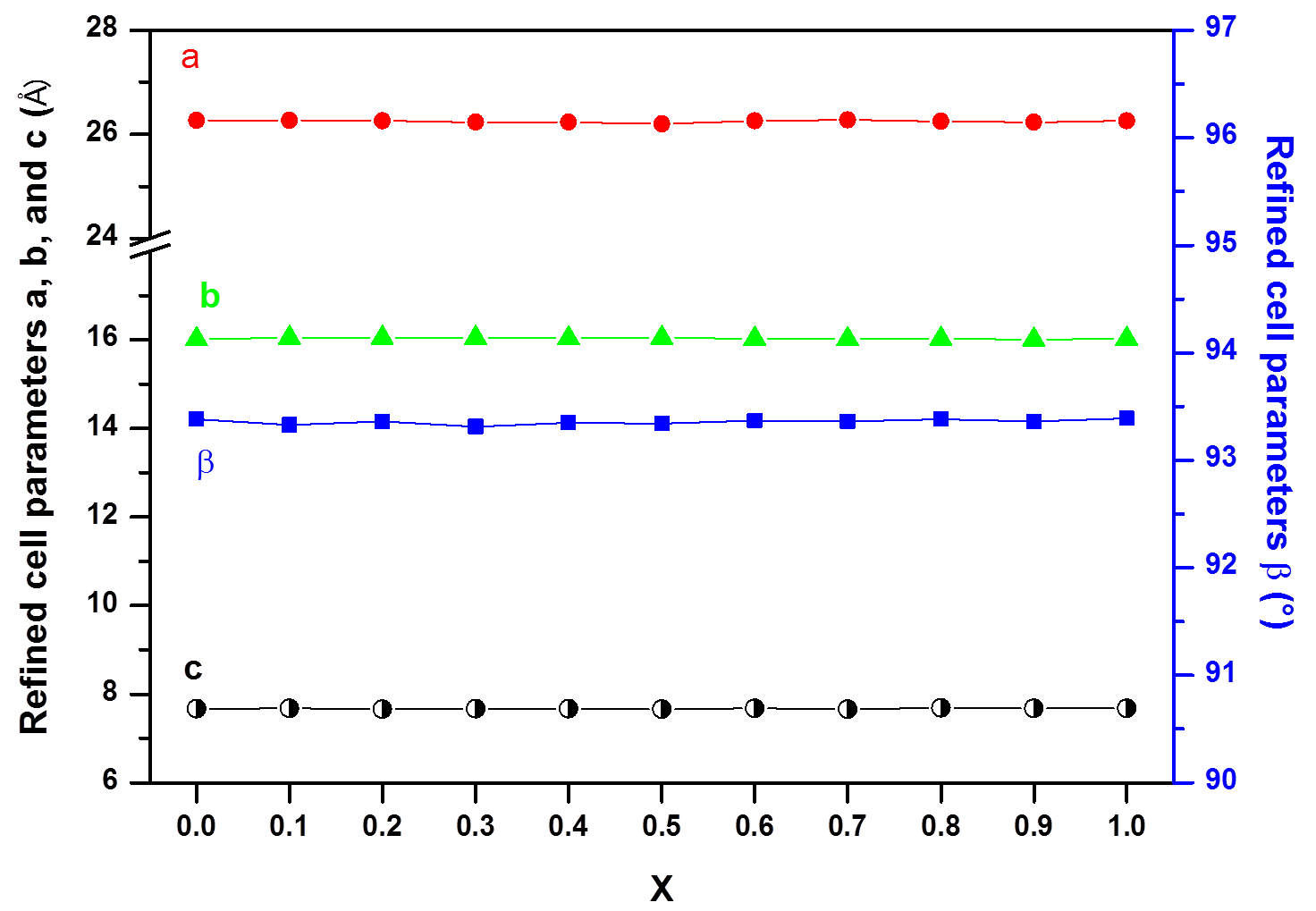
**Figure S5**. Thermal analyzes of microcrystalline [Gd2(o-pda)3(H2O)2,2H2O]∞.



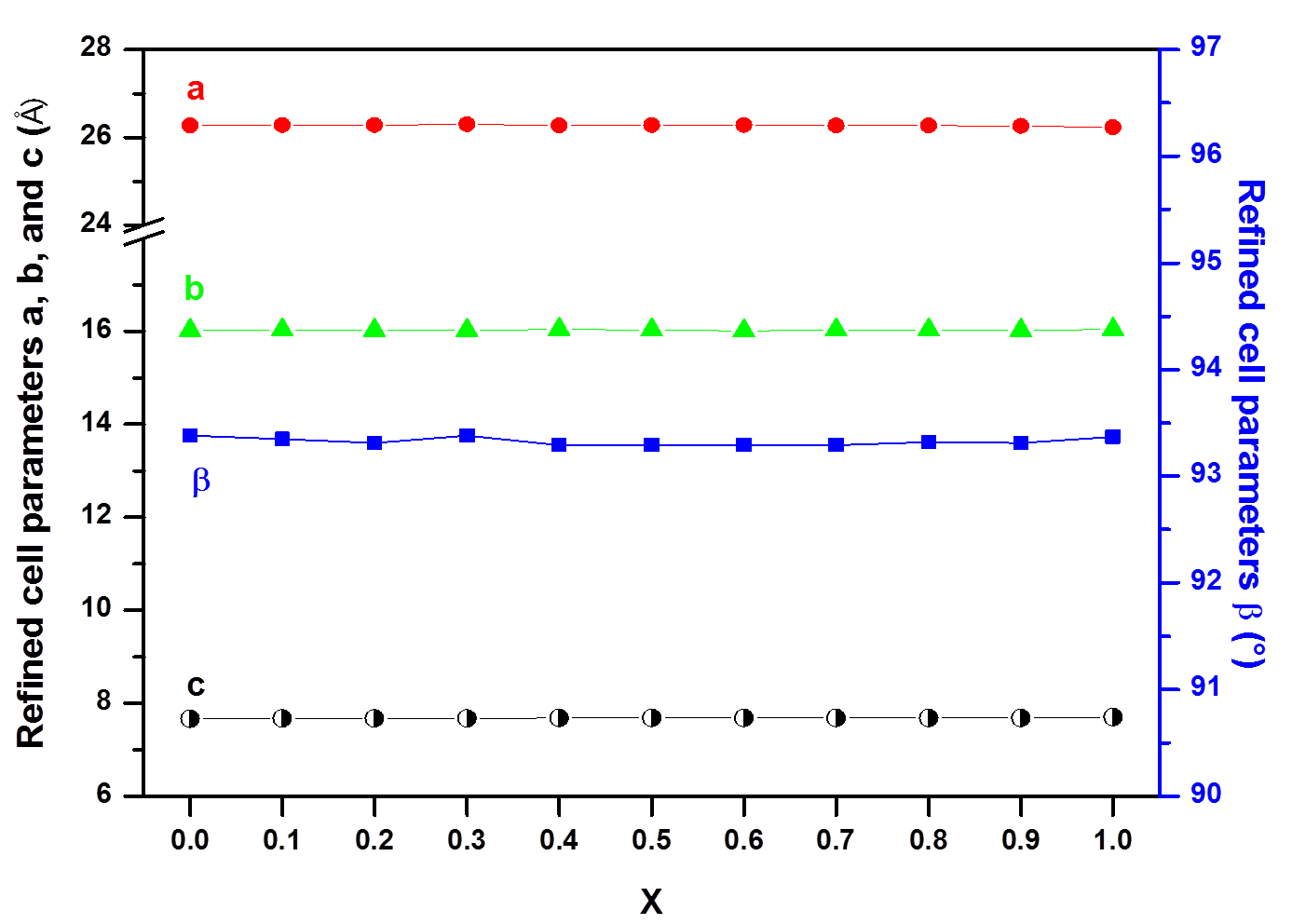
**Figure S6.** Powder X-ray diffraction diagrams for microcrystalline [Tb2-2xGd2x(o-pda)3(H2O)2,2H2O]∞ with 0 ≤ x ≤ 0.9.



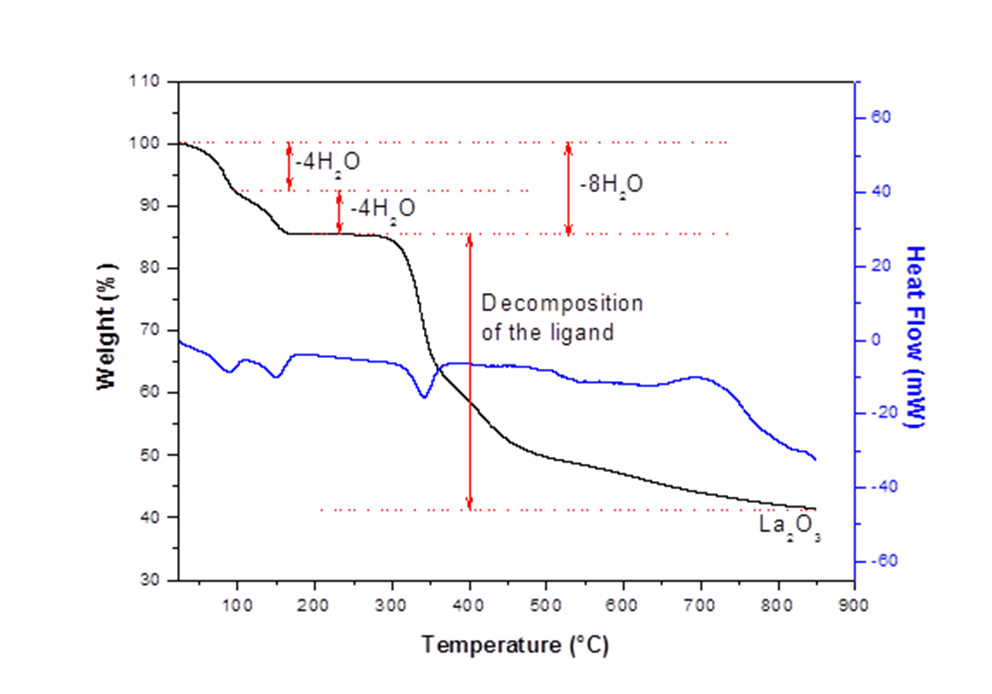
**Figure S7.** Powder X-ray diffraction diagrams for microcrystalline [Tb2-2xEu2x(o-pda)3(H2O)2,2H2O]∞ with 0 ≤ x ≤ 0.9.



**Figure S8.** Refined cell parameters for microcrystalline [Tb2-2xGd2x(o-pda)3(H2O)2,2H2O]∞ with 0 ≤ x ≤ 0.9.



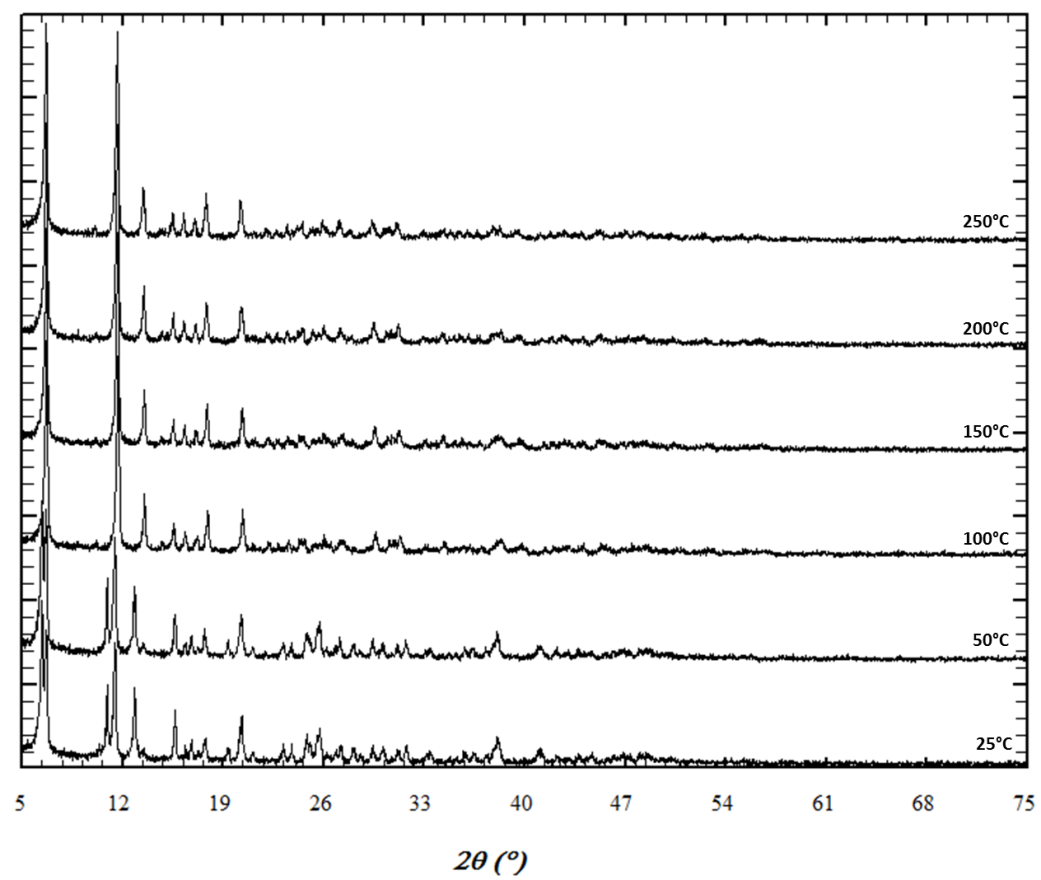
**Figure S9.** Refined cell parameters for microcrystalline [Tb2-2xEu2x(o-pda)3(H2O)2,2H2O]∞ with 0 ≤ x ≤ 0.9.



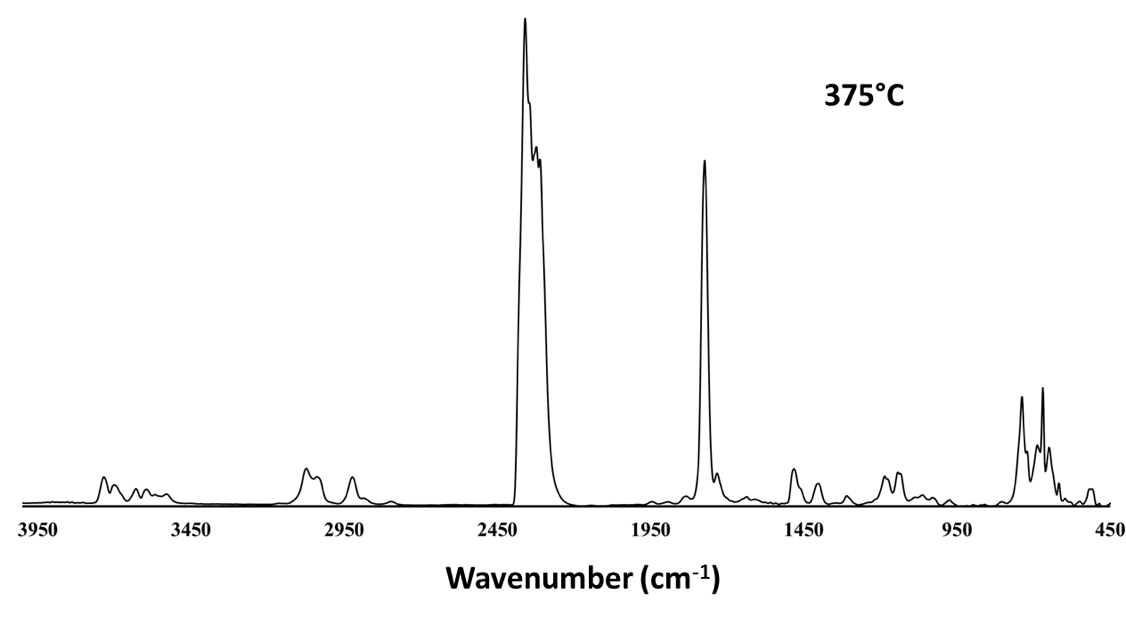
**Figure S10.** Thermal analyzes of microcrystalline [La2(o-pda)3(H2O)4,4H2O]∞ (**1**).

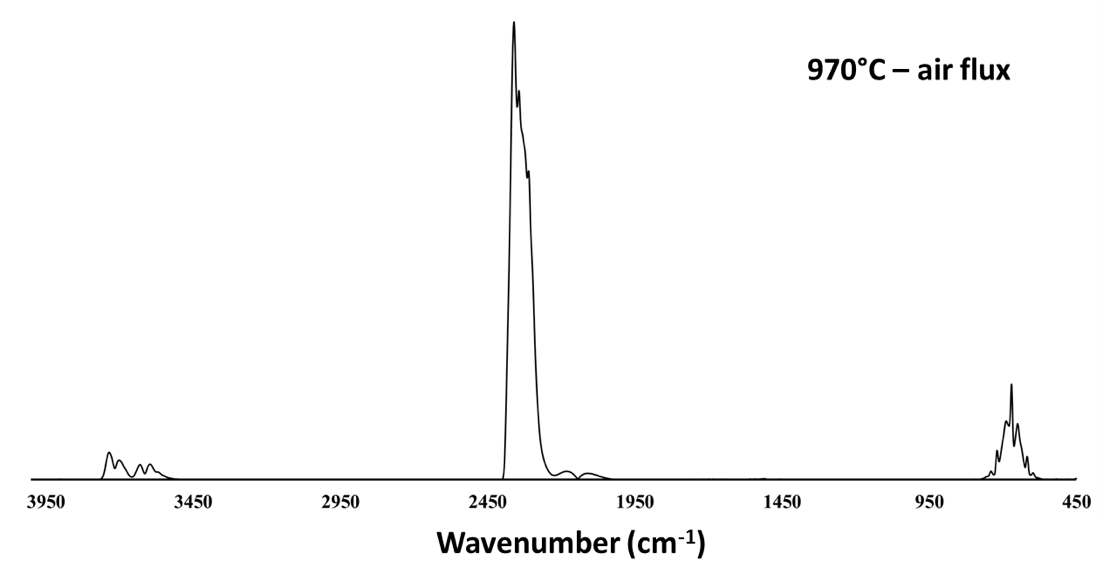
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**Figure S11.** Temperature-dependent X-ray powder diffraction of microcrystalline [La2(o-pda)3(H2O)4,4H2O]∞ (**1**).

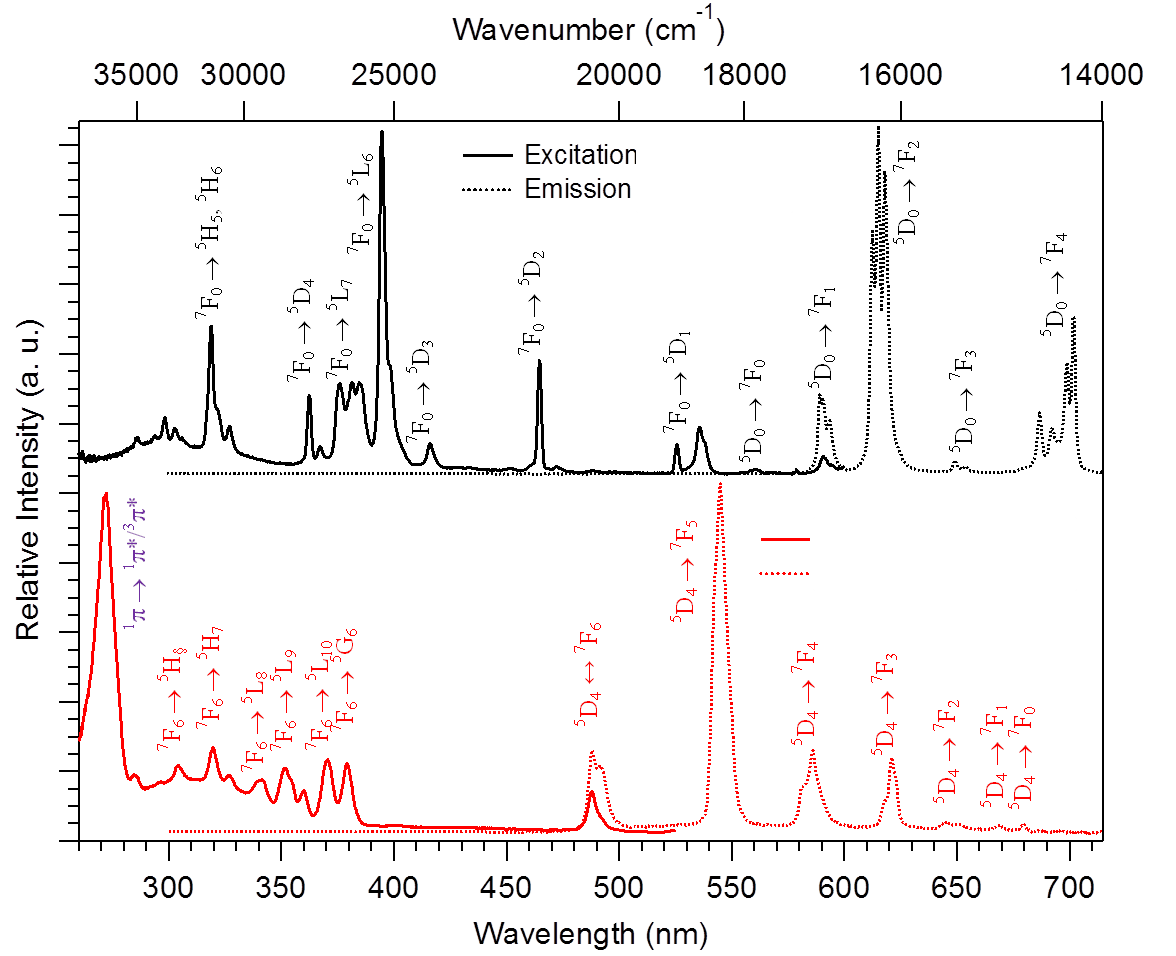


**Figure S12.** Temperature-dependent powder X-ray diffraction diagrams of microcrystalline [Gd2(o-pda)3(H2O)2,2H2O]∞ between room temperature and 250°C under nitrogen atmosphere.





**Figure S13.** IR spectrum of microcrystalline [Gd2(o-pda)3(H2O)2,2H2O]∞ recorded at 375°C (N2 flux) and 970°C (air flux).



**Figure S14.** Top: Excitation (em = 615 nm) and emission (exc = 395 nm) spectra for microcrystalline [Eu2(o-pda)3(H2O)2,2H2O]∞. Bottom: Excitation (em = 545 nm) and emission (exc = 379 nm) spectra for microcrystalline [Tb2(o-pda)3(H2O)2,2H2O]∞.

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| **Table S2.** Chemical analyzes for compounds that constitute families **(1)** and **(2)**. | | | | | |
| Chemical formula | MW (g.mol-1) | %C  calc. (found) | %H  calc. (found) | %O  calc. (found) | %Ln  calc. (found) |
| [La2(o-pda)3(H2O)4,4H2O]∞ | 998.45 | 36.1 (36.0) | 4.0 (4.1) | 32.1 (32.2) | 27.8 (27.7) |
| [Ce2(o-pda)3(H2O)2,2H2O]∞ | 928.81 | 38.8 (39.0) | 3.5 (3.5) | 27.6 (27.6) | 30.1 (29.9) |
| [Pr2(o-pda)3(H2O)2,2H2O]∞ | 930.39 | 38.7 (38.7) | 3.5 (3.4) | 27.5 (27.4) | 30.3 (30.5) |
| [Nd2(o-pda)3(H2O)2,2H2O]∞ | 937.05 | 38.5 (38.7) | 3.4 (3.5) | 27.3 (27.0) | 30.8 (30.8) |
| [Sm2(o-pda)3(H2O)2,2H2O]∞ | 949.29 | 38.0 (38.2) | 3.4 (3.3) | 27.0 (27.0) | 31.6 (31.5) |
| [Eu2(o-pda)3(H2O)2,2H2O]∞ | 952.50 | 37.8 (37.8) | 3.4 (3.4) | 26.9 (27.0) | 31.9 (31.8) |
| [Gd2(o-pda)3(H2O)2,2H2O]∞ | 963.07 | 37.4 (37.4) | 3.3 (3.5) | 26.6 (26.4) | 32.7 (32.7) |
| [Tb2(o-pda)3(H2O)2,2H2O]∞ | 966.43 | 37.3 (37.5) | 3.3 (3.1) | 26.5 (26.4) | 32.9 (33.0) |
| [Dy2(o-pda)3(H2O)2,2H2O]∞ | 973.57 | 37.0 (36.9) | 3.3 (3.3) | 26.3 (26.2) | 33.4 (33.6) |
| [Ho2(o-pda)3(H2O)2,2H2O]∞ | 978.44 | 36.8 (36.9) | 3.3 (3.4) | 26.2 (26.3) | 33.7 (33.4) |
| [Er2(o-pda)3(H2O)2,2H2O]∞ | 983.09 | 36.7 (36.5) | 3.3 (3.3) | 26.0 (26.2) | 34.0 (34.0) |
| [Tm2(o-pda)3(H2O)2,2H2O]∞ | 986.44 | 36.5 (36.5) | 3.3 (3.4) | 25.9 (25.8) | 34.3 (34.3) |
| [Yb2(o-pda)3(H2O)2,2H2O]∞ | 994.65 | 36.2 (36.0) | 3.3 (3.1) | 25.7 (25.9) | 34.8 (35.0) |
| [Lu2(o-pda)3(H2O)2,2H2O]∞ | 998.51 | 36.1 (36.2) | 3.2 (3.2) | 25.6 (25.6) | 35.1 (35.0) |
| [Y2(o-pda)3(H2O)2,2H2O]∞ | 826.39 | 43.6 (43.5) | 3.9 (4.0) | 31.0 (31.0) | 21.5 (21.5) |

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| **Table S3.** Relative lanthanide ratios for [Tb2-2xGd2x(o-pda)3(H2O)2,2H2O]∞ with 0.1 ≤ x ≤ 0.9 | | | | | | | | | |
|  | % (expected) | | | | % (measured) | | | | |
|  | Gd | | Tb | | Gd | | Tb | | |
| x=0.9 | | 90 | | 10 | | 86.4 ± 4 | | 13.6 ± 4 |
| x=0.8 | | 80 | | 20 | | 83.7 ± 2 | | 16.3 ± 2 |
| x=0.7 | | 70 | | 30 | | 72 ± 6 | | 28 ± 6 |
| x=0.6 | | 60 | | 40 | | 64.7 ± 2 | | 35.3 ± 2 |
| x=0.5 | | 50 | | 50 | | 52.3 ± 0.7 | | 47.7 ± 0.7 |
| x=0.4 | | 40 | | 60 | | 43.4 ± 3 | | 56.6 ± 3 |
| x=0.3 | | 30 | | 70 | | 30.8 ± 2 | | 69.2 ± 2 |
| x=0.2 | | 20 | | 80 | | 20.4 ± 0.8 | | 79.6 ± 0.8 |
| x=0.1 | | 10 | | 90 | | 10 ± 2 | | 90 ± 2 |

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| **Table S4.** Relative lanthanide ratios for [Tb2-2xEu2x(o-pda)3(H2O)2,2H2O]∞ with 0.1 ≤ x ≤ 0.9 | | | | |
|  | % (expected) | | % (measured) | |
|  | Eu | Tb | Eu | Tb |
| x=0.9 | 90 | 10 | 91.4 ± 2 | 8.6 ± 2 |
| x=0.8 | 80 | 20 | 81 ± 2 | 19 ± 2 |
| x=0.7 | 70 | 30 | 74 ± 4 | 26 ± 4 |
| x=0.6 | 60 | 40 | 62.3 ± 4 | 37.7 ± 4 |
| x=0.5 | 50 | 50 | 48 ± 2 | 52 ± 2 |
| x=0.4 | 40 | 60 | 43.3 ± 2 | 56.7 ± 2 |
| x=0.3 | 30 | 70 | 31 ± 2 | 69 ± 2 |
| x=0.2 | 20 | 80 | 17 ± 3 | 83 ± 3 |
| x=0.1 | 10 | 90 | 12 ± 2 | 88 ± 2 |