## Electronic Supplementary Information

## Uranyl oxide hydrate frameworks with lanthanide ions

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**Figure S1**. Powder XRD patterns of **UOF-Eu** (a) and **UOF-Gd** (b) with measured on top of simulated ones.





Figure S2. A backscattered SEM image (top) and an EDS spectrum (bottom) of compound UOF-Eu.



Figure S3. EDS mapping of UOF-Eu.



50µm



Figure S4. A backscattered SEM image (top) and an EDS spectrum (bottom) of compound

UOF-Gd.



Figure S5. EDS mapping of UOF-Gd.



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**Figure S6**. A polyhedral view of uranyl cation-cation interactions between U1/U2/U3 and double U7 polyhedra in **UOF-Eu** and **UOF-Gd**.



Figure S7. Thermogravimetric analysis results for UOF-Gd.



Figure S8. PXRD patterns of the residue oxide U-Gd (top) and UO<sub>2</sub> (bottom) for comparison, with minor  $U_3O_8$  (\*) in U-Gd.



**Figure S9**. A Backscattered SEM image (top) and an EDS spectrum (bottom) of the residue oxide (**U-Gd**) from the thermal decomposition of **UOF-Gd**.