Supplementary Information

Novel perfluorodiphenylphosphinic acid lanthanide (Er or Er/Yb) complex with high NIR photoluminescence quantum yield

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Fig. S1. The X-ray energy dispersive spectrum from the complex $[(C_6F_5)_2POO]_3Er_{0.5}Yb_{0.5}$.

Table S1. The EDS analysis results for the complex $[(C_6F_5)_2POO]_3Er_{0.5}Yb_{0.5}$.

<table>
<thead>
<tr>
<th>Element</th>
<th>Weight%</th>
<th>Atomic%</th>
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<tbody>
<tr>
<td>C</td>
<td>9.67</td>
<td>18.62</td>
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<tr>
<td>O</td>
<td>6.48</td>
<td>9.36</td>
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<tr>
<td>F</td>
<td>51.71</td>
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<td>P</td>
<td>7.73</td>
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<tr>
<td>Er</td>
<td>12.32</td>
<td>1.70</td>
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<tr>
<td>Yb</td>
<td>12.09</td>
<td>1.62</td>
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<tr>
<td>Totals</td>
<td>100.00</td>
<td></td>
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</table>
**Fig. S2.** The ESI mass spectrum in the negative mode of perfluorodiphenyl phosphinic acid in methanol; m/z [(C₆F₅)₂POO]⁻: 397.

**Fig. S3.** IR spectrum of perfluorodiphenyl phosphinic acid.
Fig. S4. The EI mass spectrum of tris-(pentafluorophenyl)-phosphine.

Fig. S5. The EI mass spectrum of tri-(pentafluorophenyl)-phosphine oxide.