Supplementary Material

Figure S1. IR spectra of B1NNp, B2NNp, B3NNp and as-prepared boehmite. Figure S2. Steady-state fluorescence emission for B2NNp ($\lambda_{exc} = 280$ nm) (pH values: 1.46, 1.96, 2.58, 3.07, 3.87, 4.25, 4.63, 5.06, 5.72, 6.30, 7.00, 7.61, 8.23, 8.77, 9.21, 9.61, 10.22, 10.90, 11). Figure S3. Steady-state fluorescence emission for B1NNp ($\lambda_{exc} = 280$ nm) (pH values: 2.00, 2.45, 2.79, 3.71, 4.30, 4.66, 5.08, 5.60, 6.27, 6.81, 7.29, 7.79, 8.21, 8.53, 8.94, 9.37, 9.78, 10.21, 10.70, 11.21, 11.65). Figure S4. Fluorescence emission intensity vs. pH curves recorded in water for the systems: A) B2NNp + Cu$^{2+}$, B) B2NNp + Zn$^{2+}$. Figure S5. Left: Variation with pH of the emission spectra of the system B2NNp + ATP. Right: Stern-Volmer plot of the system B2NNp + ATP at pH = 3. Figure S6. Left: Variation with pH of the emission spectra of the system B1NNp + ATP. Right: Stern-Volmer plot of the system B1NNp + ATP at pH = 3. Figure S7. Fluorescence emission intensity vs. pH curves recorded in water for the systems: A) B3NNp + Cd$^{2+}$. Figure S8. Fluorescence emission intensity vs. pH curves recorded in water for the systems: A) B3NNp + Pb$^{2+}$. Figure S9. Fluorescence emission intensity vs. pH curves recorded in water for the systems: A) B3NNp + Co$^{2+}$. Figure S10. Fluorescence emission intensity vs. pH curves recorded in water for the system 3NNp + Pb$^{2+}$. Figure S11. Fluorescence emission intensity vs. pH curves recorded in water for the system 3NNp + Cd$^{2+}$. Table S1. Stability constants for the formation of Cu$^{2+}$, Zn$^{2+}$, Cd$^{2+}$ and Co$^{2+}$ complexes 3NNp determined in 0.15 M NaCl at 298.1 K.
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Figure S9. Fluorescence emission intensity vs. pH curves recorded in water for the systems: A) B3NNp + Co^{2+}.
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Table S1. Stability constants for the formation of Cu$^{2+}$, Zn$^{2+}$, Cd$^{2+}$ and Co$^{2+}$ complexes with 3NNp determined in 0.15 M NaCl at 298.1 K.

<table>
<thead>
<tr>
<th>Reaction</th>
<th>Cu$^{2+}$</th>
<th>Zn$^{2+}$</th>
<th>Cd$^{2+}$</th>
<th>Co$^{2+}$</th>
<th>Pb$^{2+}$</th>
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<tr>
<td>M+L ⇌ ML</td>
<td>14.79(1) b,c</td>
<td>7.60(2) c</td>
<td>6.67(5)</td>
<td>6.89(5)</td>
<td>7.04(3)</td>
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<tr>
<td>M+L+ H$_2$O ⇌ ML(OH)+ H</td>
<td>-4.98(3)</td>
<td>-1.79(3)</td>
<td>-2.85(8)</td>
<td>-2.99(4)</td>
<td></td>
</tr>
</tbody>
</table>

a) Charges omitted. b) Figures in parentheses are standard deviation in the last significant figures. c) Taken from ref. 18.