Supporting Information for the manuscript:

A Single Molecule Magnet to Single Molecule Magnet Transformation via a Solvothermal Process: Fe\textsubscript{4}Dy\textsubscript{2} → Fe\textsubscript{6}Dy\textsubscript{3}

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Table S1 Magnetic data of compounds 1-4 summarised from the dc measurements.

<table>
<thead>
<tr>
<th>Compound</th>
<th>Ground state of Ln\textsuperscript{iii}</th>
<th>$\chi T$ expected for non-interacting ions per complex (cm\textsuperscript{3} K mol\textsuperscript{-1})</th>
<th>$\chi T$ measured at 300 K per complex (cm\textsuperscript{3} K mol\textsuperscript{-1})</th>
<th>$\chi T$ measured at 1.8 K per complex (cm\textsuperscript{3} K mol\textsuperscript{-1})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fe\textsubscript{4}Y\textsubscript{2}, 1</td>
<td>17.5</td>
<td>14.5</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Fe\textsubscript{4}Dy\textsubscript{2}, 2</td>
<td>$^6\text{H}_{15/2}$</td>
<td>45.8</td>
<td>42.3</td>
<td>32.6</td>
</tr>
<tr>
<td>Fe\textsubscript{6}Y\textsubscript{3}, 3</td>
<td>26.3</td>
<td>12.0</td>
<td>0.75</td>
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<tr>
<td>Fe\textsubscript{6}Dy\textsubscript{3}, 4</td>
<td>$^6\text{H}_{15/2}$</td>
<td>68.8</td>
<td>54.7</td>
<td>31.1</td>
</tr>
</tbody>
</table>

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Figure S1 Field dependence of magnetisation at low temperature for compound 1 (top-left), 2 (top-right) and 3 (bottom).

Figure S2 Temperature dependence of the in-phase ($\chi'$) (left) and out-of-phase ($\chi''$) (right) ac susceptibility components at the indicated frequencies in zero dc field for 2.
Figure S3 Cole-Cole plots under zero dc field for compound 2.

Figure S4 Arrhenius plot using ac data under zero dc field for compound 2.

Figure S5 Frequency dependence of the in-phase ($\chi'$) (left) and out-of-phase ($\chi''$) (right) ac susceptibility components under the indicated dc fields at 1.8 K for 2.
**Figure S6** Temperature dependence of the in-phase ($\chi'$) (left) and out-of-phase ($\chi''$) (right) ac susceptibility components at the indicated frequencies under 500 Oe dc field for 2.

**Figure S7** Arrhenius plot using ac data under 500 Oe dc field for compound 2.

**Figure S8** Arrhenius plot using ac data under 1000 Oe dc field for compound 4.