Supporting information

Two [Au(CN)$_2$]–-bridged Heterometallic Coordination Polymers Directed by Different 2,2’-bipyridyl-like ligands

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Fig. S1(a). Perspective view of the pseudo-hexagonal channel in 1 along the c axis (the Cd atoms are represented by green, blue and pink spheres, respectively; The [Au(CN)\textsubscript{2}]\textsuperscript{−} groups are represented by Cd···Cd links (light orange lines)).

Fig. S2(b). Perspective view of the phen ligands in the network of 1 along the c axis (the Cd, C and N atoms are represented by green, light blue and sky blue spheres, respectively; The [Au(CN)\textsubscript{2}]\textsuperscript{−} groups are represented by Cd···Cd links (light orange lines)).
**Fig. S2.** View of the supramolecular structure of 2 showing Au···Au (in gold dotted lines) and two kinds of hydrogen bonds (in red and blue dotted lines).

<table>
<thead>
<tr>
<th>D-H···A</th>
<th>Bond Length (D-H)</th>
<th>Distance (H···A)</th>
<th>Distance (D···A)</th>
<th>Angle (D-H···A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>O2-H2···N4</td>
<td>0.820</td>
<td>2.298</td>
<td>2.789</td>
<td>118.53</td>
</tr>
<tr>
<td>O2-H2···O1#1</td>
<td>0.820</td>
<td>2.447</td>
<td>3.224</td>
<td>158.64</td>
</tr>
</tbody>
</table>

Symmetry transformations used to generate equivalent atoms: #1: -x, -y+1, -z+1.

The codes that represented the symmetry transformations used to generate equivalent atoms of Fig. 1-2:

Fig. 1a: zero: -y, x-y; A: -1+x, x-y, 2-z;

Fig. 2a: zero: -1+x, -1+y, z; A: -0.5+x, -0.5+y, z;

Fig. 2b: A: -0.5+x, -0.5+y, z; B: -x, -y, 1-z;

Fig. 2c: A: -0.5+x, -0.5+y, z; B: -x, -y, 1-z; C: x, -1+y, z; D: -0.5-x, 0.5-y, 1-z; E: 0.5-x, -0.5-y, 1-z; F: -1+x, y, z.