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Supporting information for article:

Assembled structures of tetrakis(biimidazole)dirhodium complexes hydrogen-bonded with common inorganic anions

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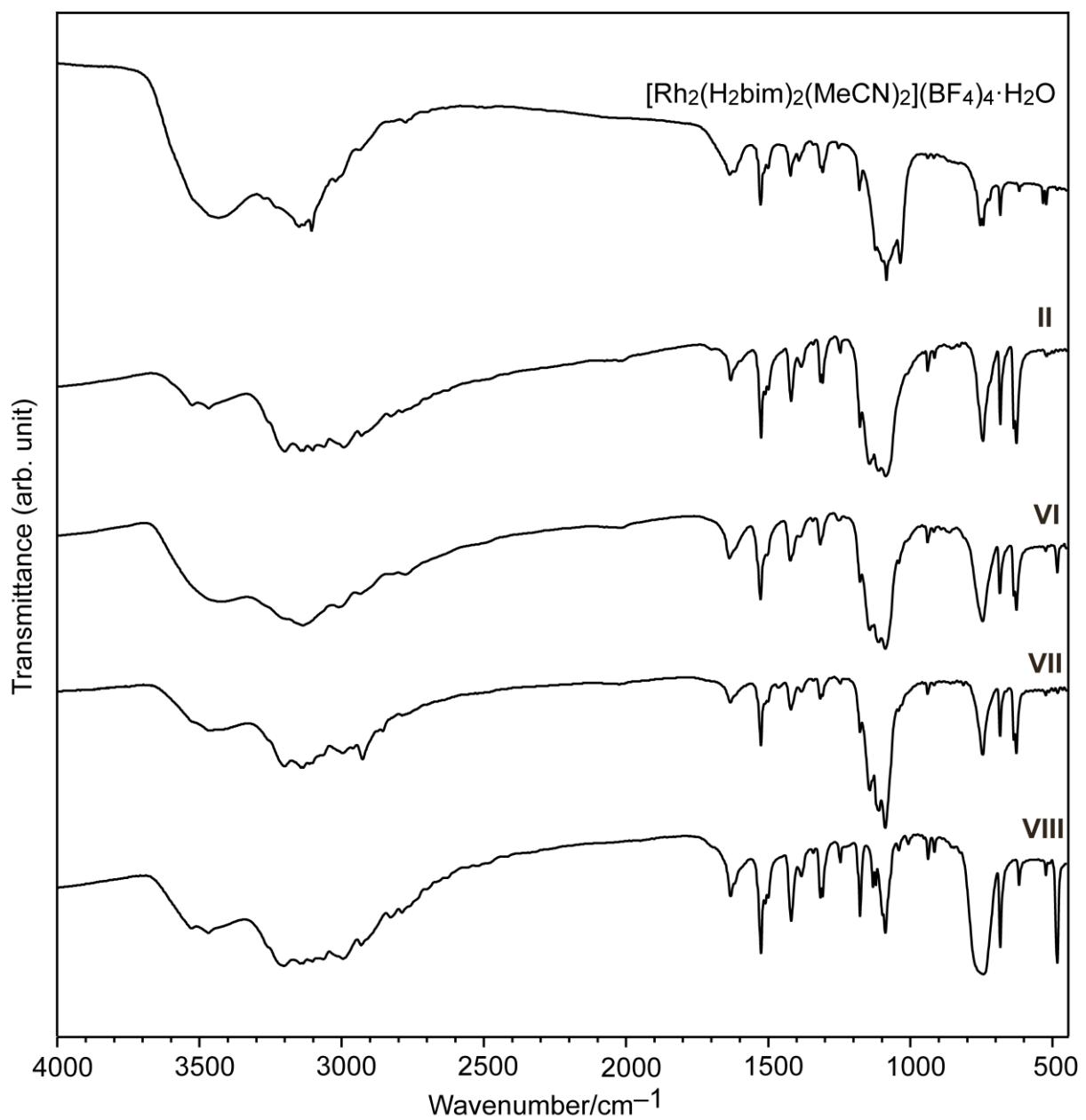


Figure S1 IR spectra of the stable compounds: $[\text{Rh}_2(\text{H}_2\text{bim})_2(\text{MeCN})_2](\text{BF}_4)_4 \cdot \text{H}_2\text{O}$, (II), (VI), (VII) and (VIII).

Table S1 Selected geometric parameters (\AA , $^\circ$) for (II)

| | | | |
|------------------------|------------|------------------------|------------|
| O1…O3 ⁱⁱ | 3.136(6) | O20…O11 | 2.790 (18) |
| O1…O22 | 2.744(6) | O20…O21 ^{iv} | 3.100 (10) |
| O2…O15A | 2.976(8) | O21…O4 ^v | 3.291 (13) |
| O2…O23 | 2.678 (8) | O21…O15B ^{vi} | 3.193 (18) |
| O18…O22 ⁱⁱⁱ | 2.770 (8) | O22…O1 | 2.744 (6) |
| O19…O5 ^{iv} | 3.018 (9) | O22…O12 ^{vii} | 3.177 (14) |
| O19…O7 ^{iv} | 2.916 (9) | O23…O4 ^v | 3.281 (15) |
| O19…O8 ^{iv} | 3.146 (11) | O23…O5 ^v | 3.173 (12) |
| O20…O8 ^{iv} | 3.131 (12) | O23…O7 ⁱⁱⁱ | 3.070 (12) |

Symmetry codes: (ii) $-x+1, -y+1, -z+1$; (iii) $x+1/2, -y+1/2, z+1/2$; (iv) $x-1/2, -y+1/2, z+1/2$; (v) $-x+2, -y+1, -z+1$; (vi) $x+1/2, -y+1/2, z-1/2$; (vii) $-x+1/2, y-1/2, -z+3/2$.

Table S2 Selected geometric parameters (\AA , $^\circ$) for (V)

| | | | |
|----------------------|------------|----------------------|----------|
| O1…O2 | 2.877 (1) | O3…O4 | 2.82 (2) |
| O2…F3 | 2.926 (11) | O4…F1 ^{iv} | 3.25 (2) |
| O2…F3 ⁱⁱⁱ | 3.186 (11) | O4…F2 | 3.13 (2) |
| O2…F5 | 2.932 (12) | O4…F5 ⁱⁱⁱ | 2.87 (2) |
| O2…F6 ⁱⁱⁱ | 3.018 (9) | O4…O4 ^v | 3.05 (3) |
| O3…F2 | 2.88 (2) | O4…O4 ⁱ | 3.20 (3) |
| O3…O3 ⁱ | 2.86 (2) | O4…O4 ^{vi} | 3.26 (3) |

Symmetry codes: (i) $-x+1, -y+1, z$; (iii) $-x+1/2, y, -z+3/4$; (iv) $y, -x+1/2, z+1/4$; (v) $y, x, -z+1$; (vi) $-x+1, -y+1, -z+1$.

Table S3 Selected geometric parameters (\AA , $^\circ$) for (VI)

| | | | |
|-----------------------|------------|-----------------------|------------|
| O1W…O5 ⁱⁱⁱ | 3.304 (18) | O4W…O11 ⁱ | 2.997 (14) |
| O1W…O9 ^{iv} | 3.212 (15) | O4W…O6W ^{iv} | 2.89 (2) |
| O1W…O11 ^{iv} | 3.224 (12) | O6W…O1 ⁱⁱ | 2.77 (3) |
| O1W…O2W | 2.775 (13) | O6W…O7W | 3.09 (4) |
| O1W…O4W ^v | 3.103 (14) | O6W…O9W ^{vi} | 2.81 (4) |
| O2W…O4 | 2.880 (13) | O7W…F1 ⁱⁱ | 2.89 (3) |
| O2W…O3W ^{iv} | 2.756 (11) | O7W…F3 ^v | 3.15 (4) |
| O3W…O8 | 2.872 (9) | O7W…O8W | 3.25 (4) |
| O3W…O10 | 3.096 (10) | O8W…O2 | 2.66 (4) |
| O4W…F2 | 3.079 (14) | | |

Symmetry codes: (i) $-x+1, -y+1, -z+1$; (ii) $x+1/2, -y+3/2, -z+1$; (iii) $x, -y+3/2, z-1/2$; (iv) $x-1/2, -y+3/2, -z+1$; (v) $-x+1/2, y+1/2, z$; (vi) $x, -y+3/2, z+1/2$.

Table S4 Selected geometric parameters (\AA , $^\circ$) for (VII)

| | | | |
|-----------------------|------------|------------------------|------------|
| O1W…O5 ^{iv} | 3.03 (2) | O4W…O11 ⁱ | 2.714 (16) |
| O1W…O2W | 2.754 (17) | O4W…O13 ⁱⁱⁱ | 2.988 (17) |
| O1W…O4W ⁱⁱ | 3.041 (18) | O4W…O6W ⁱⁱ | 3.02 (3) |
| O2W…O4 | 2.886 (16) | O5W…O14 ⁱⁱ | 2.99 (5) |
| O2W…O3W ^v | 2.825 (15) | O5W…O16 ⁱⁱ | 2.83 (4) |
| O3W…O8 | 2.918 (13) | O6W…O1 ^{vi} | 3.03 (3) |
| O3W…O10 | 3.008 (13) | O6W…O7W | 2.86 (4) |
| O3W…O5W | 2.85 (4) | O7W…O16 ⁱⁱ | 3.12 (4) |
| O3W…O6W | 3.18 (3) | | |

Symmetry codes: (i) $-x+1, -y+1, -z+1$; (ii) $-x+1/2, y+1/2, z$; (iii) $-x, -y+1, -z+1$; (iv) $x, -y+3/2, z-1/2$; (v) $x-1/2, -y+3/2, -z+1$; (vi) $x+1/2, -y+3/2, -z+1$.

Table S5 Selected geometric parameters (\AA , $^\circ$) for (VIII)

| | | | |
|---------------------|------------|---------------------|------------|
| O1…O2 | 2.797 (10) | O3…F4 ^{iv} | 3.120 (14) |
| O1…F3 ^{iv} | 2.895 (15) | O3…F6 ^{iv} | 3.23 (1) |
| O2…F5 | 2.931 (13) | O3…F3 ^{iv} | 3.254 (14) |
| O2…F5 ^v | 3.08 (1) | | |

Symmetry codes: (iv) $-x+3/2, y+1/2, -z+1/2$; (v) $-x+3/2, -y+3/2, -z+1$.