Supporting Information

$[Cr(dmbipy)(ox)_2]^-$: a new bis-oxalato building block for metal assembling. Crystal structures and magnetic properties of $XPPh_4[Cr(dmbipy)(ox)_2] \cdot 5H_2O$ (X = P and As), $\{Ba(H_2O)_2[Cr(dmbipy)(ox)_2]_2\}_n \cdot 17/2nH_2O$ and $\{Ag(H_2O)[Cr(dmbipy)(ox)_2]\}_n \cdot 3nH_2O$

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Fig. S1 Perspective view of the $[Cr(dmbpy)(ox)_2]^-$ anion of **1** showing the atom numbering. The hydrogen atoms other than those of the methyl groups were omitted for clarity.

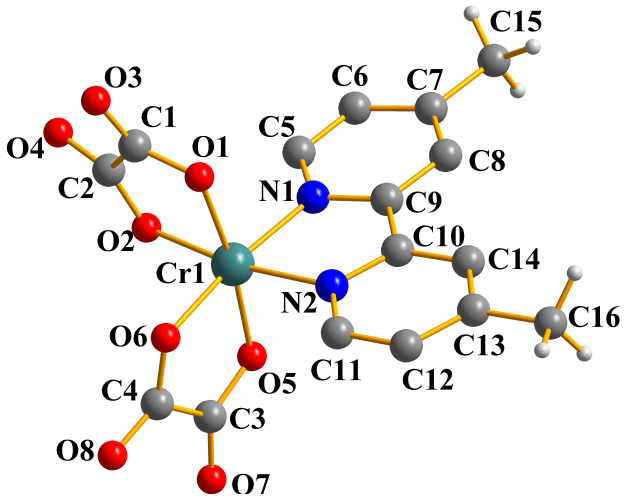

Fig. S2 A view showing the SPE and DPE supramolecular interactions between the PPh_4^+ cations in **2**. Regular alternating SPE interactions occur along *b* with P(1)···P(1k) = 6.143(2) Å and P(1)···P(1j) = 6.552(2) Å whereas two DPE interactions develop along the [210] direction with P(1)···P(1l) = 9.153(3) Å and P(1j)···P(1m) = 10.890(4) Å [symmetry code: (j) = –*x*, 1–*y*, –*z*; (k) = –*x*, 2–*y*, –*z*; (l) = 1–*x*, 2–*y*, –*z*; (m) = 1+*x*, *y*, *z*].

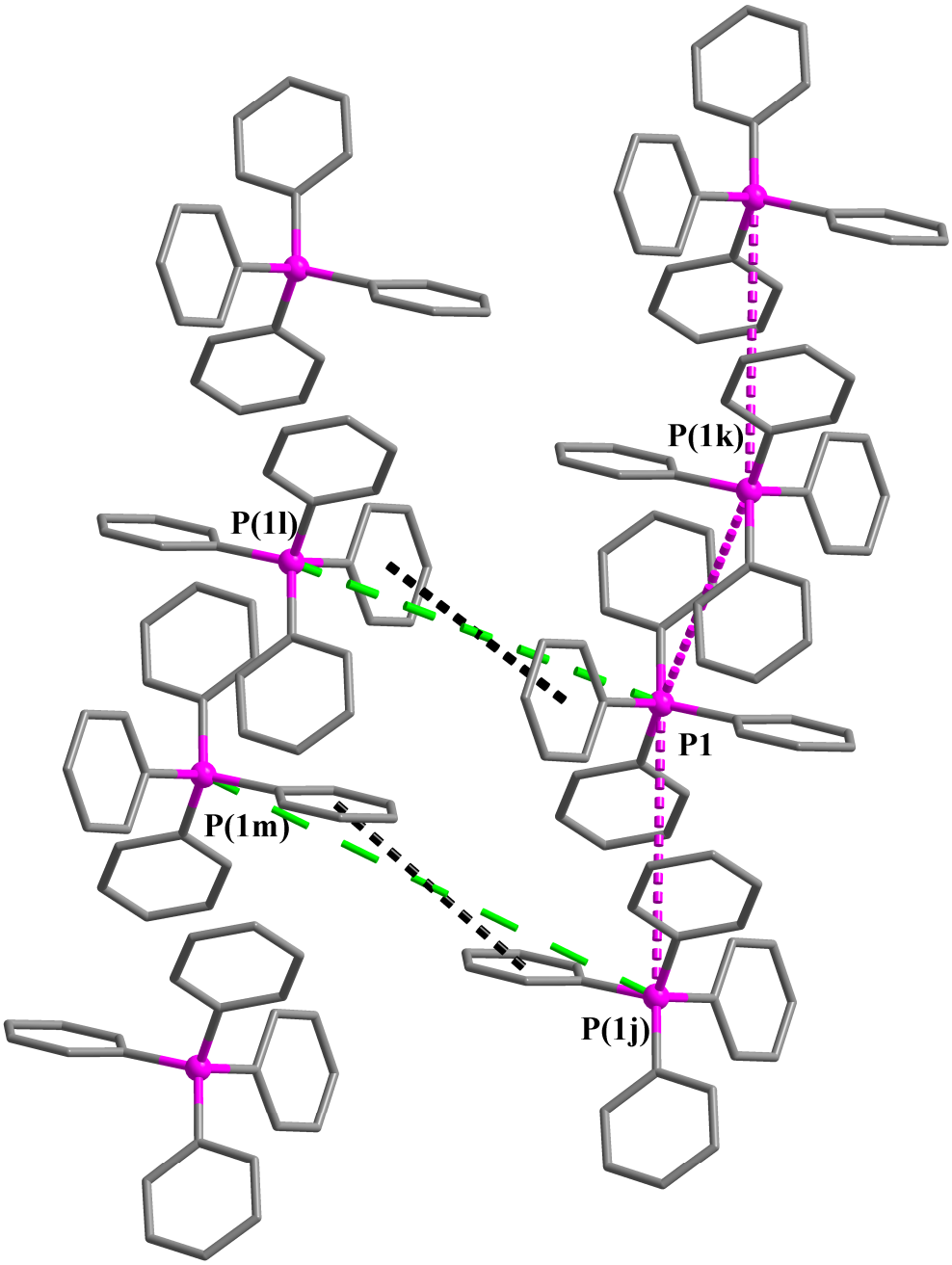

Table S1 Hydrogen-bonding interactions in **1**[a,b]

D–H···A	D···A/Å
O(3)···O(1Wc)	3.117(5)
O(3)···O(2Wc)	3.004(5)
O(3)···O(5Wc)	2.818(8)
O(4)···O(1Wc)	3.191(5)
O(4)···O(3Wd)	3.027(6)
O(7)···O(1W)	2.907(4)
O(7)···O(2W)	2.868(4)
O(3W)···O(5W)	2.716(8)
O(3W)···O(4We)	3.018(7)
O(4W)···O(1W)	2.892(7)
O(4W)···O(5W)	2.925(9)

[a] D = Donor, A = Acceptor. [b] Symmetry code: (c) = –x, 1+y, z; (d) = 1+x, 1+y, z; (e) = 1–x, 1–y, 1–z.

Table S2 Hydrogen-bonding interactions in **3**[a,b]

D–H···A	D···A/Å
O(1W)···O(2W)	2.746(12)
O(1W)···O(8W)	2.696(14)
O(1W)···O(10W)	3.147(15)
O(1W)···O(4We)	2.772(9)
O(2W)···O(12b)	2.810(9)
O(2W)···O(17)	3.233(10)
O(2W)···O(3We)	2.690(9)
O(3W)···O(4W)	2.771(8)
O(3W)···O(6W)	2.962(7)
O(4W)···O(8)	2.888(7)
O(5W)···O(3)	2.809(7)
O(5W)···O(7b)	3.124(7)
O(5W)···O(17b)	2.852(8)
O(5W)···O(5Wd)	2.713(8)
O(6W)···O(4a)	2.866(7)
O(6W)···O(18)	2.875(6)
O(6W)···O(15d)	2.995(7)
O(7W)···O(13)	2.815(6)
O(7W)···O(18)	3.042(4)
O(8W)···O(11W)	2.60(2)
O(8W)···O(14)	2.790(14)
O(8W)···O(17)	2.763(15)
O(9W)···O(5a)	2.840(10)
O(9W)···O(11W)	2.56(2)
O(9W)···O(14)	2.778(11)
O(10W)···O(11W)	2.09(2)
O(10W)···O(17)	3.184(12)
O(10W)···O(1f)	3.144(12)

[a] D = Donor, A = Acceptor. [b] Symmetry codes: (a) = x, 1+y, z; (b) = x, 1–y, z; (c) = –x, y, 1/2–z; (d) = 1–x, y, 1/2–z; (e) = x, 1+y, 1/2–z; (f) = –x, 1+y, 1/2–z.

Table S3 Hydrogen-bonding interactions in **4**[a,b]

D–H···A	D···A/Å
O(1W)···O(2Wc)	2.845(11)
O(1W)···O(9c)	3.093(10)
O(1W)···O(4d)	2.764(9)
O(2W)···O(8)	2.745(9)
O(2W)···O(1Wc)	2.845(11)
O(2W)···O(9c)	2.668(11)
O(3W)···O(2)	3.169(9)
O(3W)···O(3a)	2.925(10)
O(3W)···O(9b)	2.918(11)

[a] D = Donor, A = Acceptor. [b] Symmetry codes: (a) = –x+1/2,y−1/2, −z+1/2; (b) = −x, −y+1, −z; (c) = 1–x, 1–y, –z; (d) = 1/2+x, 3/2–y, –1/2+z.