Metal-Organic Framework Structures – how closely are they related to Classical Inorganic Structures

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Electronic Supplementary Information
Figure S1: The figures illustrate 12 six-membered fundamental rings around a single node of the diamond net, which correspond to 2 rings per angle.
Figure S2: The figures illustrate the vertex symbol of the \textit{cds} net. The figures show that around a single node of the \textit{cds} net, four angles are associated with one 6-membered fundamental ring, one angle is associated with two 6-membered fundamental rings and the other one is associated with two 8-membered shortest circuits. The eight membered shortest circuits are composed of two 6-membered fundamental rings.
Figure S3: (a) The 10-membered fundamental ring of the srs net in $[\text{Zn}_2(\text{BTC})(\text{NO}_3)]\cdot\text{H}_2\text{O}\cdot5\text{C}_2\text{H}_5\text{OH}$ (BTC = 1,3,5-benzentricarboxylate), (b) The three-dimensional connectivity between the 3-connected Zn$_2$(COO)$_3$ units (light blue sphere) and the 3-connected BTC units (purple sphere) forming the srs net. One single 10-membered ring is highlighted by the orange bonds.

Figure S4: (a) The 10-membered fundamental ring (based on connectivity of the Zn$^{2+}$ ion through oxalate linker) of the ths net in [C$_3$H$_7$NH$_3$][Zn$_2$(C$_2$O$_4$)$_3$]·3H$_2$O. (b) The connectivity of 3-connected Zn$^{2+}$ ions forming ths topology. One single 10-membered ring is highlighted by the orange bonds.

Figure S5: (a) Figure shows that Ag$^+$ is connected with four btza unit in [Ag(btza)].CH$_3$OH (btza = bis(1,2,4-triazol-1-yl)acetate), (b) Figure shows that btza is connected with four Ag$^+$ ions, (c) The connectivity between the Ag$^+$ ions and btza units forming the sra net.
Figure S6: (a) Figure shows that In$^{3+}$ ions is connected with four 1,4-bdc in [InH(bdc)$_2$]. (bdc = terephthalate) (b) Figure shows that 1,4-bdc is connected with two In$^{3+}$ ions, (c) The connectivity between the In$^{3+}$ ions and 1,4-bdc units forming the qtz (SiO$_2$) net.
Figure S7: (a) The connectivity between the planar Cu$_2$(COO)$_4$ units and the 2-bromo-terephthalate linkers in Cu$_2$(o-Br-bdc)$_2$(H$_2$O)$_2$.8DMF.2H$_2$O (o-Br-bdc = 2-bromo-terephthalate), (b) The connectivity of 4-connected Cu$_2$(COO)$_4$ units (light blue sphere) forming nbo topology.
Figure S8: (a) Figure shows the three-dimensional structure of [M$_2$(2,2'-bipy)$_2$(1,3-bdc)$_3$].2H$_2$O (M = Y, Gd, Dy; 1,3-bdc = isophthalate) through the connectivity of the M$_2$ unit and the isophthalate (1,3-bdc), (b) Figure shows the connectivity of the 4-connected M$_2$-units (light blue sphere) forming ccds topology.
Figure S9: (a) Figure shows the connectivity between Eu$^{3+}$ ions and the 1,3-adamanetanedicarboxylate in [Eu$_2$C$_{10}$H$_{14}$(COO)$_2$)$_3$], (b) Figure shows the connectivity of the five-connected Eu forming bnn net.
Figure S10: (a) Figure shows the connectivity between Zn$^{2+}$ ions and HCOO$^-$ anions (formate) with [(CH$_3$)$_2$NH$_2$]$^+$ ion at the middle forming perovskite structure in [(CH$_3$)$_2$NH$_2$]Zn(HCOO)$_3$. (b) The ideal perovskite structure with the general formula of ABX$_3$. Note the similarity between the two structures.
Figure S11: (a) Figure shows La$^{3+}$ ion is connected with eight other La$^{3+}$ ions through 4,4'-bipyridine-N, N'-dioxide bridging ligand in [La(4,4'-bipyridine-N, N'-dioxide)$_4$(CF$_3$SO$_3$)$_3$.4.CH$_3$OH, (b) Figure shows the connectivity of the 8-connected La$^{3+}$ ions forming bcu topology. The elementary cell edge of the bcu structure is shown by violet line.
Figure S12: (a) Figure shows the connectivity between the Cu⁺ (tetrahedral) ions and the 3-connected TPT (trigonal) ligands in [Cu₃(tpt)₄(BF₄)₂]₂⋅3.5H₂O. (b) The connectivity between 4-connected Cu⁺ ions (cyan sphere) and 3-connected TPT ligand (purple sphere) forming C₃N₄ net. The figure a is highlighted by orange bonds based on the connectivity of the nodal positions.
Figure S13: (a) Figure shows Zn$_2$(COO)$_2$O$_4$ unit is connected with six 1,3,5-benzenetricarboxylate and act as octahedral node in [Zn(1,3,5-benzenetricarboxylate)]$_n$NH$_2$(CH$_3$)$_2$.DMF, (b) Figure shows 1,3,5-benzenetricarboxylate unit is connected with three Zn$_2$(COO)$_2$O$_4$ units, (c) The connectivity between the Zn$_2$(COO)$_2$O$_4$ unit and the 1,3,5-benzenetricarboxylate forming rtl topology. The elementary cell edge of the rutile structure is shown by violet line.
Figure S14: (a) Figure shows Zn₄O(COO)₆ unit is connected with six TCPPDA units and acts as octahedral node in [Zn₄O(D₂-tcppda).DMF·H₂O (DMF = N, N'-dimethylformamide, D₂-tcppda = N, N, N', N'-tetrakis(4-carboxyphenyl)-1,4-phenylenediamine with D₂ symmetry), (b) Figure shows TCPPDA unit is connected with four Zn₄O(COO)₆ units and acts as tetrahedral node, (c) The connectivity between the six connected Zn₄O(COO)₆ units and four connected D₂-TCPPDA forming cor net.
Figure S15: (a) Figure shows Cd₄ cluster is connected with eight TCPM ligands and acts as a cubic node in [Cd₄(TCPM)₂(DMF)₄].4DMF.4H₂O (TCPM = tetrakis-(4-carboxyphenyl) methane), (b) TCPM ligand is connected four Cd₄ clusters and acts as tetrahedral node, (b) The connectivity between the 8-connected Cd₄ and the four connected TCPM ligands to form fluorite net.