SUPPORTING INFORMATION

Oxamate-Based Potassium-Organic Assembly With the Uncommon Binodal (6,12)-Coordinated alb Topology.

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†To the beloved memory of Prof. Miguel Julve.

Table S1- Some details of the metal complexes with H_4mpba; H_4opba, H_4ppba, and H_4edpba as ligands in the last two decades (2000-2023).

Oxamate-derivate compound	**CSD code**	**Salt**	**Acid/ester**	**Building block**	**Reference**
$Na_4[Cu_2(mpba)_2]$. $10H_2O$	VODXUH	-	Et_2H_2mpba/ NaOH	-	[1]
$Na_8[Ni_2(mpba)_3]\cdot 10H_2O$	-	-	H_4mpba/ NaOH	-	[2]
$\{[Ni_2(mpba)_3][Ni(dpt)(H_2O)]_6\}(ClO_4)_4\cdot$ $12.5H_2O$	FAJFIG	-	-	$Na_8[Ni_2(mpba)_3]\cdot 10H_2O$	[2]
$\{[Cu_2(mpba)_2][Cu(tmen)]_4\}(ClO_4)_4\cdot 6H_2O$	-	-	-	$Na_4[Cu_2(mpba)_2]$. $10H_2O$	[3]
$[Co_2Cu_2(mpba)_2(H_2O)_6]\cdot 6H_2O$	EVUCED	-	-	$Na_4[Cu_2(mpba)_2]$. $10H_2O$	[4]
$Li_5[Li_3Co_2(mpba)_3(H_2O)_6]\cdot 31H_2O$	POBNEA	-	Et_2H_2mpba/ LiOH	-	[5]
$Li_2[Mn_3Co_2(mpba)_3(H_2O)_6]\cdot 22H_2O$	-	-	-	$Li_5[Li_3Co_2(mpba)_3(H_2O)_6]\cdot$ $31H_2O$	[5]
$Na\{[M_2(mpba)_3[Cu(Me_5dien)]_6\}(ClO_4)_6\cdot 12H_2O$ M= Cu^{II}; Ni^{II}	EXEDUG/FA JFIG	-	Et_2H_2mpba/ NaOH	-	[6]
$[Na(H_2O)_4]_4[Mn_4\{Cu_2(mpba)_2(H_2O)_4\}3]\cdot 56\cdot 5H_2O$	DAPXID	-	-	$Na_4[Cu(mpba)_2]\cdot 10H_2O$	[7]
$Na_8[M^{II}_2(mpba)_3]\cdot 15H_2O$ M= N^{iII}; x= $15H_2O$; Co^{II}; x=17 H_2O	VEHNED/ VEHNIH	-	Et_2H_2mpba/ NaOH	-	[8]
$TBA_2[Co_2(H_2mpba)_3]\cdot 2DMF\cdot 5H_2O$	KEVKON		Et_2H_2mpba/ TBAOH	-	[9]
$(HNEt_3)_2[Co_2(H_2mpba)_3]\cdot 6DMF\cdot 5H_2O$	KEVKUT		H_4mpba$\cdot 3H_2O$ / NEt_3	-	[9]
$Mn_4(H_2mpba)_4(H_2O)_{12}]\{[Mn_8Cu_8(mpba)_8(H_2O)_{24}]\}\cdot$ $29.5H_2O$	QEJSEF	-	-	$Na_4[Cu_2(mpba)_2]\cdot 10H_2O$	[10]

$[Mn_4Cu_4(mpba)_4(H_2O)_9]\cdot 14H_2O$	QEJSIJ	-	-	$Na_4[Cu_2(mpba)_2]\cdot 10H_2O$	[10]
$[Cu(bipy)(H_2mpba)]_2\cdot 2H_2O$	QIQYOG	K_2H_2mpba	-	-	[11]
$[Cu(bipy)(H_2mpba)]\cdot dmso$	QIQYUM	K_2H_2mpba	-	-	[11]
$\{[K_4(H_2O)(dmso)][Pd_2(mpba)_2]\}$	BUBGIQ	-	-	$K_4[Pd_2(mpba)_2]\cdot 4H_2O$	[12]
$\{[Cu(bpca)]_4[Pd_2(mpba)_2]\}\cdot 6H_2O$	BUBJOZ	-	-	$K_4[Pd_2(mpba)_2]\cdot 4H_2O$	[12]
$[EDAP\{Li_6(H_2O)_8[(Cu_2(\mu\text{-}mpba)_2)_2(H_2O)_2]\}]_n$	CEBZIW	-	Et_2H_2mpba/ LiOH	-	[13]
$[(EDAP)_2\{K(H_2O)_4[Cu_2(\mu\text{-}mpba)_2(H_2O)_2]\}Cl\cdot 2H_2O]_n$	CEBZUI	-	Et_2H_2mpba/ KOH	-	[13]
$\{[K_2(dmf)_2(H_2O)_2][Co_2(H_2mpba)_3]\cdot 2H_2O\}_n$	GUDHUL	K_2H_2mpba	-	-	[14]
$\{[K_2(dmf)_2(H_2O)_2][Ni_2(H_2mpba)_3]\cdot 2H_2O\}_n$	GUDJAT	K_2H_2mpba	-	-	[14]
$[Co(tppz)_2][Co_2(H_2mpba)_3]\cdot 9H_2O$	GUDHOF	K_2H_2mpba	-	-	[14]
$[Ni(tppz)_2][Ni_2(H_2mpba)_3]\cdot 9H_2O$	GUDHIZ	K_2H_2mpba	-	-	[14]
$[Co(H_2O)_6][Co_2(H_2mpba)_3]\cdot 2H_2O\cdot 0.5dmso$	UYIQOL	K_2H_2mpba	-	-	[15]
$[Co(H_2O)_6][Co_2(H_2mpba)_3]\cdot 3H_2O\cdot 0.5dpss$	UYIQUR	K_2H_2mpba	-	-	[15]
$[Co_2(H_2mpba)_2(H_2O)_4]_n\cdot 4nH_2O$	UYIQEB	K_2H_2mpba	-	-	[15]
$[Co_2(H_2mpba)_2(CH_3OH)_2(H_2O)_2]_n\cdot 0.5nH_2O\cdot 2n$dpss	UYIQIF	K_2H_2mpba	-	-	[15]
$\{[K_2(dmso)_2(H_2O)_2][Ni_2(H_2mpba)_3]\cdot 2H_2O\}_n$	-	K_2H_2mpba			[16]
$[Ni_2(H_2mpba)_3][Ni(H_2O)_6]$	-	K_2H_2mpba			[16]
Oxamate-derivate compound	**CSD code**	**Salt**	**Acid/ester**	**Building block**	**Reference**
$Na_4[Cu_2(ppba)_2(H_2O)_2].\ 10H_2O$	OLEMIB	-	-	$Li_4[Cu_2(ppba)_2].\ 10H_2O$	[17]
$\{[Cu_2(ppba)_2][Cu(pmdien)]_4\}(ClO_4)_4$	IYAVUZ	-	-	$Li_4[Cu_2(ppba)_2].\ 10H_2O$	[3]
$(Bu_4N)_4[Cu_2(ppba)]\cdot 2CH_3OH$	PIJPEF	-	H_2Et_2ppba/ nBu_4NOH	-	[18]
$[\{Cu(bpca)\}_2(H_2ppba)]\cdot dmso$	EQAQIY	-	H_4ppba/ [Cu(bpca)	-	[19]

			$(H_2O)_2]NO_3 \cdot 2H_2O$		
$[\{Cu(bpca)\}_2(H_2ppba)]\cdot 6H2O$	EQAQOE	K_2H_2ppba	-	-	[19]
$(Bu_4N)_4[Pd_2(ppba)_2]$	-	-	H_2Et_2ppba/ nBu_4NOH	-	[20]

Oxamate-derivate compound	**CSD code**	**Salt**	**Acid/ester**	**Building block**	**Reference**
$[Bu_4N][Mn_2\{Cu(opba)\}_3\cdot 4DMF\cdot 5H_2O$	-	-	-	$(Bu_4N)_2[Cu(opba)]$	[21]
$[Bu_4N][Co_2\{Cu(opba)\}_3\cdot DMF\cdot H_2O$	-	-	-	$(Bu_4N)_2[Cu(opba)]$	[21]
$Na_2[Co_2\{Cu(opba)\}_3]\cdot 2DMSO\cdot 6H_2O$	-	-	-	$Na_2[Cu(opba)]\cdot H_2O$	[22]
$[CoCu(opba)(DMSO)_3]$	JEBLAE/ JEBLAE01	-	-	$Na_2[Cu(opba)]\cdot 3H_2O$	[23]
$[CoCu(opba)]\cdot 4H_2O\}n$	-	-	-	$Na_2[Cu(opba)]\cdot 3H_2O$	[24]
$(PPh_4)_2[Pd(opba)]\cdot 2H_2O$	KEMGIU	-	-	$K_2[Pd(opba)]\cdot 2H_2O$	[25]
$\{[Co(H_2O)_2Pd(opba)]\cdot dmso\}_n$	KEMGOA/ KEMGOA01	-	-	$K_2[Pd(opba)]\cdot 2H_2O$	[25]
$\{[Cu(bpca)]_2[Cu(opba)(H_2O)]\}\cdot H_2O$	REZFUZ	-	-	$(Bu_4N)_2[Cu(opba)]$	[26]
$\{[Cu(bpca)]_2(H_2opba)\}_2\cdot 6H_2O$	REZFOT	-	Et_2H_2opba	$Me_4N[Mn(opba)(H_2O)_2]$	[26]
$[Cu(bpca)(EtH_2opba)]_n$	REZFIN	-	Et_2H_2opba	-	[26]
$(Bu_4N)_2[Mn_2\{Cu(opba)\}_2ox]_n$	IDIGUZ	-	-	$(Bu_4N)_2[Cu(opba)]$	[27]
$[Pd(NH_3)_4][Pd(opba)]$	JOHTEH	-	-	$K_2[Pd(opba)]\cdot 2H_2O$	[28]
$\{[Cu(bpca)]_2[Pd(opba)]\}\cdot 1.75dmso\cdot 0.25H_2O$	BUBHOX	-	-	$K_2[Pd(opba)]\cdot 2H_2O$	[12]
$\{[Cu(bpca)]_2[Pd(opba)]\}_n$ ndmso	BUBHIR	-	-	$K_2[Pd(opba)]\cdot 2H_2O$	[12]
$[Ni(tpa)Cu(opba)]_2\cdot 6H_2O$	YEQNOA	-	-	$(Bu_4N)_2[Cu(opba)]$	[29]
$[\{Cu(opba)(H_2O)_{1.2}\}\{Cu(dmphen)(SCN)\}_2]\cdot dmf$	GOJHOF	-	-	$(Bu_4N)_2[Cu(opba)]$	[30]
$[\{Cu(opba)\}_2\{Cu(dmphen)Cl\}_4]\cdot 1.5dmf\cdot 2.5dmso$	GOJHUL	-	-	$(Bu_4N)_2[Cu(opba)]$	[30]
$\{Cu(opba)\}_2\{Cu(dmphen)Br\}_4]\cdot dmf\cdot 2.3dmso$	GOJJAT	-	-	$(Bu_4N)_2[Cu(opba)]$	[30]
$[\{Cu(opba)\}\{Cu(dmphen)(dca)\}_2]_n$	GOJJEX	-	-	$(Bu_4N)_2[Cu(opba)]$	[30]

Oxamate-derivate compound	**CSD code**	**Salt**	**Acid/ester**	**Building block**	**Reference**

$[Cu_2(H_2edpba^{anti})_2(EtOH)_2].2EtOH$	AGODIL	-	Et_2H_2edpba/ Et_4NOH	-	31
$[n\text{-}Bu_4N]_4[Cu_2(edpba^{gauche})_2].4H_2O$	AGODUX	-	Et_2H_2edpba/ Bu_4NOH	-	31
$[Ni(bipy)(H2edpba)]\cdot dmso$	DOVKIK	$K_2(H_2edpba)$	-	-	32
$[Cu(bipy)(H_2edpba)]n\cdot 3nH_2O\cdot ndmso$	DOVKEG	-	-	$[Ni(bipy)(H_2edpba)]\cdot dmso$	32
$[Cu(bipy)(H_2edpba)]n\cdot 1.5nH_2O$	DOVQOK	$K_2(H_2edpba)$	-	-	32
$[Mn_5Cu_5(edpba)_5(dmso)_7(H_2O)_7]\cdot 4dmso\cdot 2H_2O$	WUHCAF	-	-	$(Bu_4N)_4[Cu_2(edpba)_2]\cdot 4H_2O$	33
$\{Mn(H_2edpba)(H_2O)_2\}_2]_n$	NIDDAI	$K_2(H_2edpba)$	-	-	34
$[Mn(H_2edpba)(dmso)_2]\cdot dmso\cdot CH_3COCH_3\cdot H_2O$	NIDDEM	-	-	$\{Mn(H_2edpba)(H_2O)_2\}_2]_n$	34
$[Fe(H_2edpba)(H_2O)_2]Cl$	-	-	H_4edpba/ Et_4NOH	-	35
$\{[Fe(H_2edpba)(dmso)]_2(\mu\text{-}O)\}\cdot dmso\cdot H_2O$	CIWVUD	-	-	$[Fe(H_2edpba)(H_2O)_2]Cl$	35

Abbreviations: H_4mpba = *N,N'*-1,3-phenylenebis(oxamic acid); Et_2H_2mpba= diethyl ester of H_4mpba; dpt= dipropylenetriamine; tmen= *N*,*N*,*N*',*N*''-tetramethylethylenediamine; Me_5dien = *N*,*N*,*N*',*N*'',*N*'''-pentamethyldiethylenetriamine; bipy = 2,2′-bipyridine; $EDAP_2^+$ =1,10-ethylenebis(4-aminopyridinium); TBA^+; Bu_4N^+= tetrabutylammonium salt; $HNEt_3^+$= triethylammonium salt; tppz = 2,3,5,6-tetrakis(2-pyridyl)pyrazine); dpss= 2,2'-dipyridyldisulfide; pmde= *N*,*N*,*N*',*N*'',*N*'''-pentamethyldiethylenetriamine; H_4ppba= *N,N'*-1,4-phenylenebis(oxamic acid); Hbpca = bis(2-pyridylcarbonyl)imide]; H_4opba = *N,N'*-1,2-phenylenebis(oxamic acid); H_2ox = oxalic acid; PPh_4= tetraphenylphosphonium cation ; EtH_3opba = monoethyl ester derivative of the H_4opba; dmphen = 2,9-dimethyl-1,10-phenanthroline; dca = dicyanamide anion ; tpa = tris(2- pyridylmethyl)amine; H_4edpba = N,N-2,2′-ethylenediphenylenebis(oxamic acid).

Table S2. Geometric analysis of the coordination environment of the potassium(I) ion in K_2H_2mpba, showing the site symmetry approximation derived from continuous shape measures (CShM; via SHAPE).[36]

Label	Symmetry	Shape	CShM*
HP-7	D_{7h}	Heptagon	32.717
HPY-7	C_{6v}	Hexagonal pyramid	19.449
PBPY-7	D_{5h}	Pentagonal bipyramid	5.576
COC-7	C_{3v}	Capped octahedron	5.232
CTPR-7	C2v	Capped trigonal prism	4.261
PBPY-7	D5h	Johnson pentagonal bipyramid J13	8.901
JETPY-7	C3v	Johnson elongated triangular pyramid J7	15.764

*The approach is incorporated into the program SHAPE, which is available for public use.[36] The high values of SHAPE measures for polyhedra of K^I in K_2H_2mpba indicate very distorted geometry.

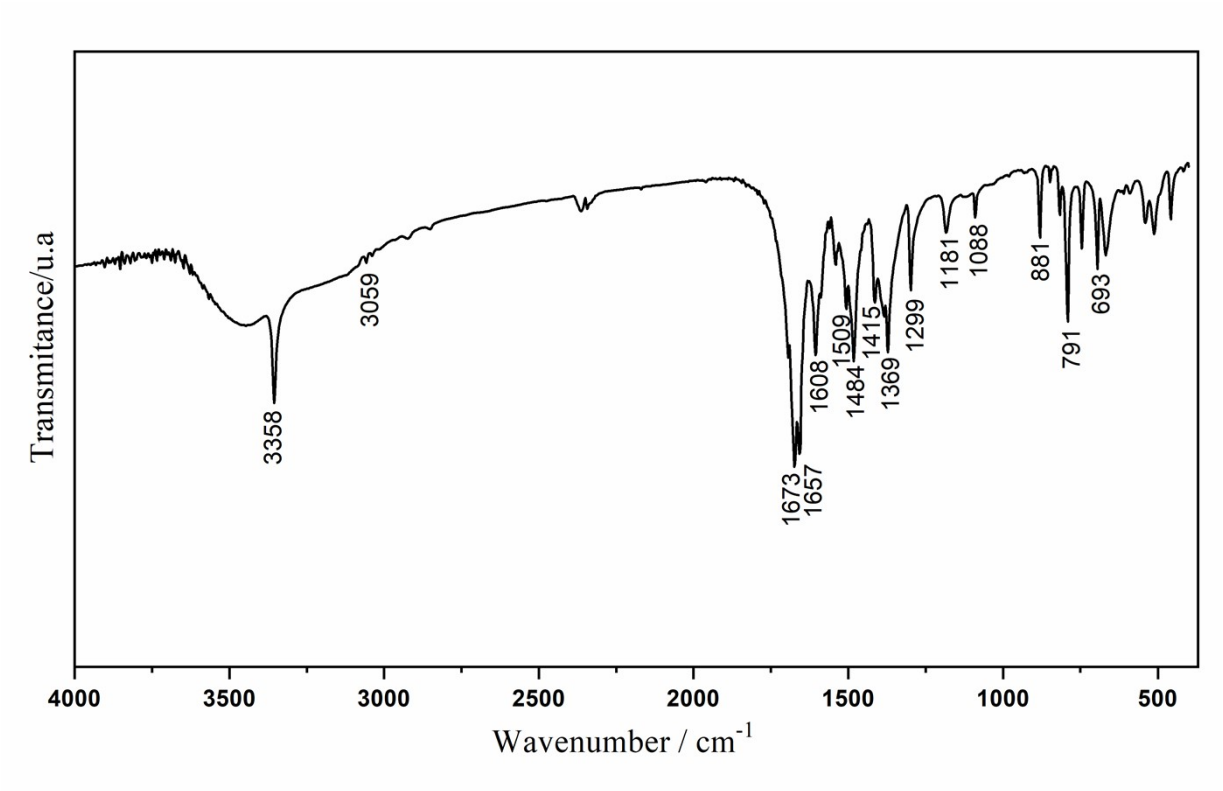

Figure S1. Infrared spectrum for K_2H_2mpba.

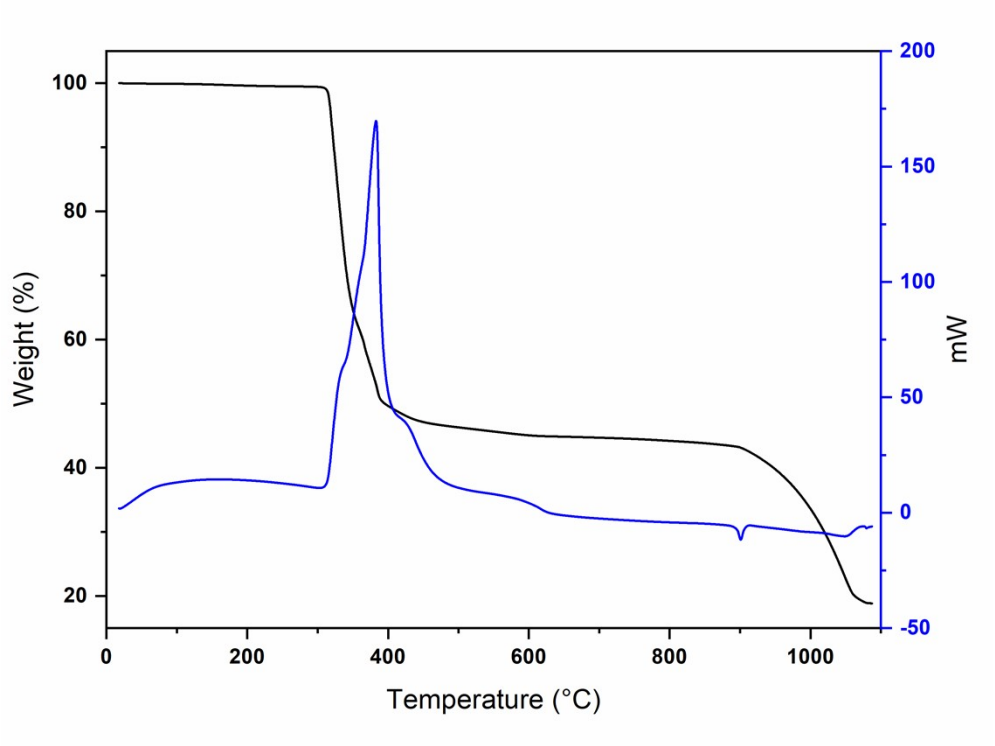

Figure S2. TGA and DTA curves for K_2H_2mpba.

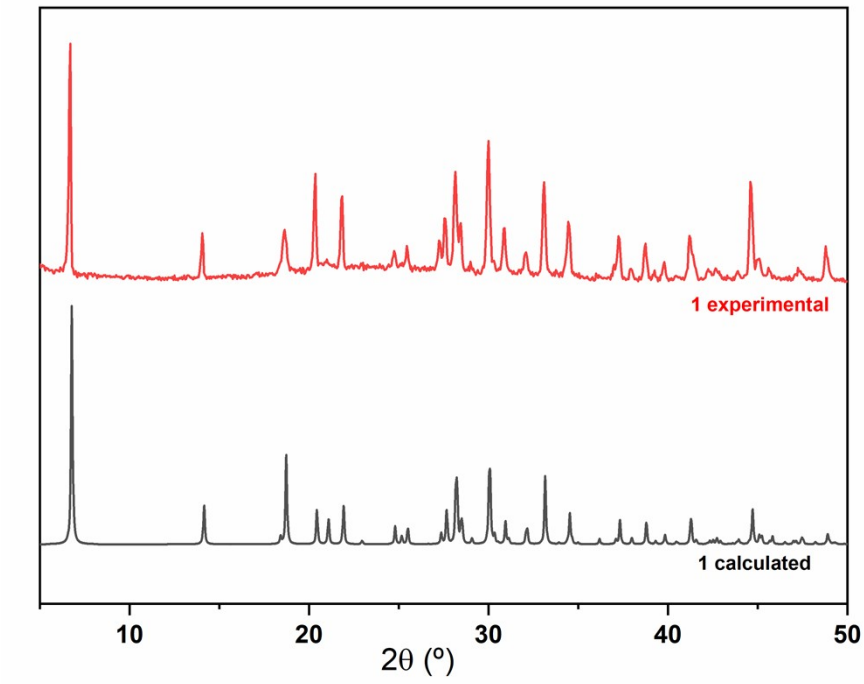

Figure S3. Experimental (red) and calculated (black) PXRD patterns for K_2H_2mpba.

TOPOSPRO OUTPUT FILES

##############

8:C5 H3 K N O3

##############

3D framework with ZB2ZA

Coordination sequences

ZA1: 1 2 3 4 5 6 7 8 9 10

Num 12 20 84 74 228 164 444 290 732 452

Cum 13 33 117 191 419 583 1027 1317 2049 2501

ZB1: 1 2 3 4 5 6 7 8 9 10

Num 6 38 42 146 114 326 222 578 366 902

Cum 7 45 87 233 347 673 895 1473 1839 2741

TD10=2661

Vertex symbols for selected sublattice

ZA1 Point symbol:{4^48.6^18}

Extended point symbol:[4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4(2).4(2).4(2).4(2).4(2).4(2).4(3).4(3).4(3).4(3).4(3).4(3).4(3).4(3).4(3).4(3).4(3).6(8).6(8).6(8).6(8).6(8).6(8).6(16).6(16).6(16).6(16).6(16).6(16).6(16).6(16).6(16).6(16).6(16).6(16)]

ZB1 Point symbol:{4^15}

Extended point symbol:[4.4.4.4.4.4.4(3).4(3).4(3).4(3).4(3).4(3).4(5).4(5).4(5)]

Point symbol for net: {4^15}2{4^48.6^18}

6,12-c net with stoichiometry (6-c)2(12-c); 2-nodal net

```
CRYSTAL
  NAME "C5 H3 K N O3"
  GROUP P6/mmm
  CELL 1.41433 1.41433 1.15451 90.0000 90.0000 120.0000
  NODE 1 12  0.00000 0.00000 0.00000
  NODE 5 6  0.33333 0.66667 0.50000
  EDGE  0.00000 0.00000 0.00000   0.33333 -0.33333 0.50000
# EDGE_CENTER  0.16667 -0.16667 0.25000
END

TILING
NAME "C5 H3 K N O3/Systre; PPT 1; [2134]; 2[4^3]+6[4^4]+[4^6] =
2[4b^3]+3[4b^2.4d^2]+3[4d^2.4e^2]+[4e^6]"
GROUP P6/mmm
FACES 4
1.00000 0.00000 0.00000
0.66667 0.33333 -0.50000
0.00000 0.00000 0.00000
0.66667 0.33333 0.50000
FACES 4
1.00000 0.00000 0.00000
0.33333 -0.33333 0.50000
0.00000 0.00000 0.00000
0.66667 0.33333 0.50000
FACES 4
1.00000 0.00000 0.00000
0.33333 -0.33333 0.50000
1.00000 0.00000 1.00000
0.66667 0.33333 0.50000
END
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Topological type: alb (topos&RCSR.ttd) {4^15}2{4^48.6^18} - VS [4.4.4.4.4.4.4(3).4(3).4(3).4(3).4(3).4(3).4(5).4(5).4(5)] [4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4(2).4(2).4(2).4(2).4(2).4(2).4(3).4(3).4(3).4(3).4(3).4(3).4(3).4(3).4(3).4(3).4(3).4(3).6(4).6(4).6(4).6(4).6(4).6(4).6(4).6(4).6(4).6(4).6(4).6(4).*.*.*.*.*.*] (17963 types in 4 databases)

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