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X-RAY BIBLIOGRAPHY

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$ZnCl_2 \cdot 1\frac{1}{3}H_2O$
(*Pbca*) $R = 6.5\%$ for 333 independent reflections. Two thirds of the zinc atoms are tetrahedrally coordinated to four chlorine atoms, the other third is octahedrally coordinated to four water molecules and two chlorine ions. Zn(*Td*)–Cl, 2.24–2.35 Å, Zn(*Oh*)–Cl, 2.60 Å; $Zn–H_2O$, 2.025 Å (average).
H. Follner and B. Brehler, *Acta Crystallogr. Ser. B*, 26 (1970) 1679.

$[\pi\text{-}C_5H_5Fe(CO)_2C_4H_5SO_2]$, a sultine derivative
($P2_1/c$) $R = 5.80\%$ for 1178 independent reflections. The $\pi\text{-}C_5H_5Fe(CO)_2$ moiety has the usual stereochemistry. The SO_2 group is not inserted into the iron-(σ-alkynyl) linkage, but forms the $Fe–C{=}C(–CH_3)–S({=}O)–O–CH_3$ sultine ring system, which is σ-bonded to the iron atom. The Fe–C distance is normal for Fe-σ vinyl compounds (1.996(8) Å). C–C distances within the sultine ring are normal, the S–O distance is 1.480(8) Å which is indicative of a S=O double bond.
M.R. Churchill and J. Wormald, *J. Amer. Chem. Soc.*, 93 (1971) 354.

$[Cu(C_{12}H_{16}NO)_2]$, a copper(II) complex of *o*-hydroxyacetophenone-isobutylimine
($P2_1/a$) $R = 3.5\%$ for 2583 independent reflections. The copper is coordinated in a square planar configuration by two ligand molecules, Cu–N (2.003(2) Å, Cu–O, (1.891(2) Å). All ligand bond lengths are normal except for the C–C bond adjacent to the phenyl ring which is lengthened to 1.465(4) Å.
C.A. Ghilardi and E.C. Lingafelter, *Acta Crystallogr. Ser. B*, 26 (1970) 1807.

$[Pr_2(thd)_6]$, praseodymium β-diketonate of 2,2,6,6-tetramethyl-3,5-heptanedione
($P2_1/n$) $R = 13.3\%$ for 3000 of 5373 measurable intensities. Each of the Pr atoms in the dimeric asymmetric $Pr_2(thd)_6$ unit is in coordination with seven oxygen atoms. Two of these are shared equally by Pr atoms. Average Pr–O is 2.446 Å.
C.S. Erasmus and J.C.A. Boeyens, *Acta Crystallogr. Ser. B*, 26 (1970) 1843.

$[Cu(NH_3)_2C_8H_4O_4]$, diammino-(*o*-phthalato)copper(II)
($P2_1/c$) $R = 7.7\%$ for 1470 reflections. The copper atom is almost square planar, coordinated by two phthalate oxygens and two ammine nitrogens. Two more oxygen atoms (at 2.31 and 2.80 Å) make up an octahedron.
M.B. Cingi, C. Guastini, A. Musatti and M. Nardelli, *Acta Crystallogr. Ser. B*, 26 (1970) 1836.

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$Pd(AsSC_9H_{13})_2I_2$, diiodobis-(dimethyl-*o*-methylthiophenylarsine)palladium(II)
($P2_1/c$) $R = 1.3\%$ for 1301 visually estimated reflections. The palladium atom is surrounded by a square planar arrangement of iodine and arsenic atoms in a *trans* configuration. The short Pd–As distance of 2.39 Å is indicative of $d_\pi - d_\pi$ bonding. Palladium and sulphur are non-bonding, the contact being greater than the sum of Van der Waals radii.
J.P. Beale and N.C. Stephenson, *Acta Crsytallogr. Ser. B*, 26 (1970) 1655.

Bisethylenediaminepalladium(II) *cis*-dithiosulphate-ethylenediaminepalladite
($P\bar{1}$) $R = 9.8\%$ for 3575 visually estimated reflections. The structure consists of $[Pd(en)_2]^{2+}$ cations and *cis*-$[Pd(S_2O_3)_2(en)]^{2-}$ anions, with both palladium atoms in square planar coordination. The S_2O_3 groups are S-bonded with the S–S bonds in these groups significantly larger than in the thiosulphate ion (2.066(6) Å)
S. Baggio, L.M. Amzel and L.N. Becka, *Acta Crystallogr. Ser. B*, 26 (1970) 1698.

$[Co_3(NH_3)_8(OH)_2(NO_2)_2(CN)_2](ClO_4)_3NaClO_4 \cdot 2H_2O$
($A2$) $R = 10\%$ for 905 independent reflections. The cation has C2 symmetry with the CN^- ions in *cis* position around the central Co atom which is ligated to two $Co(NH_3)_4$ groups by one OH and one NO_2 bridge each.
J. Weiss, H. Siebert and K. Wieghardt, *Acta Crystallogr. Ser. B*, 26 (1970) 1709.

Dichloro-2,2′,2″-terpyridylcobalt(II)
($P2_1/c$) $R = 11\%$ for 1026 independent reflections. The cobalt is in a five coordinate environment with three nitrogen atoms of the terdentate ligand and two chlorine atoms. The stereochemistry of the cobalt atom is intermediate between that of the Zn in $Zn(terpy)Cl_2$ and Co in β-Co(pyridine-2-aldehyde-2′-pyridylhydrazine).
E. Goldschmied and N.C. Stephenson, *Acta Crystallogr. Ser. B*, 26 (1970) 1867.

Diaquo zinc glycylglycylglycinato hemisulphate dihydrate
(*Pbcn*) $R = 6.5\%$ for 2095 reflections. The Zn coordination is more trigonal bipyramidal than square pyramidal. The peptide molecules form an infinite chain held together by zinc atoms.
D. Van der Helm and H.B. Nicholas, Jr., *Acta Crystallogr. Ser. B*, 26 (1970) 1858.

$[UO_2(OH)_2]$, β-uranyl dihydroxide
The space group *Pbca* was confirmed; 238 strong reflections were measured. The effects of thermal expansion on lattice parameters was studied. Expansions up to 260°C were strongly anisotropic, at temperatures exceeding this the expansion was almost isotropic.
M.J. Bannister and J.C. Taylor, *Acta Crystallogr. Ser. B*, 26 (1970) 1775.

$[Ce(NO_3)_4\{OP(C_6H_5)_3\}_2]$, tetranitratobis(triphenylphosphine oxide)cerium(IV)
($P2_1/n$) $R = 4.7\%$ for 2868 observed reflections. The cerium is ten coordinated by four bidentate nitrate groups and two oxygen atoms from triphenylphosphine oxide. The infrared spectrum is discussed. $[Th(NO_3)_4\{OP(C_6H_5)_3\}_2]$ is isostructural.
Mazhar-ul-Hague, C.N. Caughlan, F.A. Hart and R. VanNice, *Inorg. Chem.*, 10 (1971) 115.

(*a*) $[PCl_4]_2[Ti_2Cl_{10}]$, bis(tetrachlorophosphonium) di-μ-chloro-octachlorodititanate (IV) and
(*b*) $[PCl_4][Ti_2Cl_9]$, tetrachlorophosphonium tri-μ-chloro-hexachlorodititanate(IV)
(*a*) ($P\bar{1}$) $R = 6.9\%$ for 2571 observed reflections The structure consists of PCl_4^+ and edge-bridged $Ti_2Cl_{10}^{2-}$ ions.
(*b*) (*Pnma*) $R = 7.6\%$ for 1950 reflections. The structure consists of PCl_4^+ and $TiCl_9^-$ ions with the anions providing an example of face shared bioctahedra with Ti in a formal +4 oxidation state.
T.J. Kistenmacher and G.D. Stucky, *Inorg. Chem.*, 10 (1971) 122.

Bis(*N*-phenyl-2-carbamoyl-5,5′-dimethylcyclohexane-1-3 dionata)copper(II)
($P2_1/n$) $R = 9.6\%$ for 1315 observed reflections The copper is in an almost square planar environment with two long Cu—O (3.073 Å) bonds to neighbouring molecules. The molecules themselves are stacked in a plate-like fashion.
P.C. Chieh, G.G. Messmer and G J. Palenik, *Inorg. Chem.*, 10 (1971) 133.

$[(BH)_2Cu]^{2+}2Cl^- \cdot 3CuCl$, bis (*N*-benzoylhydrazine)copper(II) pentachlorotricuprate(I)
(*Pbca*) $R = 5.1\%$ for 1754 independent observed reflections. Two planar *N*-benzoylhydrazine are chelated in *cis* equatorial configuration around the Cu^{II} ion with chloride ions in the axial positions of the distorted octahedron. All five chloride ions bond to the three Cu^I ions and form an infinite cylinder of distorted tetrahedra.
R.J. Baker, S.C. Nyburg and J.T. Szymański, *Inorg Chem.*, 10 (1971) 138.

($AmCl_3 \cdot 6H_2O$), americium trichloride hexahydrate and berkelium trichloride hexahydrate, ($BkCl_3 \cdot 6H_2O$) ($P2/n$) $R = 3.9\%$ for 1468 observed reflections. The structure consists of $AmCl_2(OH_2)_6^+$ cations and Cl^- anions. The Am is eight coordinate. Am—O, 2.440(6) to 2.474(5) Å and Am—Cl, 2799(2) Å. $BkCl_3 \cdot 6H_2O$ is isostructural.
J.H. Burns and J.R. Peterson, *Inorg. Chem.*, 10 (1971) 147.

Bis (triethylammonium) octadecahydroicosaborate
($P2_1/a$) $R = 10\%$ for 1874 reflections. Two B_{10} units make up the centrosymmetric $B_{20}H_{18}^{2-}$ ion. These units are linked by two localised three centre BBB bonds over four B atoms.
C.H. Schwalbe and W.N. Lipscomb, *Inorg. Chem.*, 10 (1971) 151.

Tris (triethylammonium) μ-nitrosobis(nonahydrodecaborate)
($P2_1/n$) $R = 14\%$ for 4555 reflections The $B_{20}H_{18}NO^{3-}$ anion is made up of two $B_{10}H_9$ units joined via an apical boron to the nitrogen atom of a bridging NO group. Representative distances are B—N, 1.51(3), 1.46(3) and N—O, 1.28(2) Å. The crystals are an intense purple.
C.H. Schwalbe and W.N. Lipscomb, *Inorg. Chem.*, 10 (1971) 160.

$Hg[(i\text{-}C_3H_7O)_2PS_2]_2$, *O, O*′-diisopropylphosphorodithioatomercury
($C2/c$) $R = 5.7\%$ for 3093 independent reflections. The structure consists of helical chains running parallel to the needle axis, one $(RO)_2PS_2$ chelates, and the other bridges two

mercury atoms. Each mercury atom is surrounded by five sulphur atoms. Hg—S distances are 2.388, 2.391, 2.748, 2.888 and 3.408 Å.
S.T. Lawton, *Inorg. Chem.,* 10 (1970) 328.