STRUCTURES OF THREE POLYMORPHS OF
trans-[Pt(C66 $\left.\left.\mathrm{H}_{9}\right) \mathrm{H}\left(\mathrm{P}\left(\mathrm{C}_{6} \mathrm{H}_{5}\right)_{3}\right\}_{2}\right]$
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Bulk samples of trans-[Pt $\left(\mathrm{C}_{6} \mathrm{H}_{9}\right) \mathrm{H}\left\{\left(\mathrm{P}\left(\mathrm{C}_{6} \mathrm{H}_{5}\right)_{3}\right\}_{2}\right]$, recrystallised from methanol/benzene solution, exhibit two Pt-H stretching frequencies [1855 and $1940 \mathrm{~cm}^{-1}$ ] in their solid state infra red spectra and contain two morphologically distinct crystalline species.
Recrystallisation from each of the solvent systems methanol, acetone and acetone/dichloromethane (trace) yields separate polymorphs.
Crystals from methanol, $\underset{\sim}{1}$, are triclinic, $P \overline{1}$, with $Z=2$. Crystals from acetone, 2 , and acetone/dichloromethane, 3, are each monoclinic, $P 2_{1} / c$, with $Z=4, \quad 1$ and 3 exhibit similarly disordered cyclohexenyl ligands but eclipsed and staggered conformations, respectively, of the phosphine ligands about the p-p vectors. The cyclohexenyl disorder has been modelled successfully with RAELS [A.D. Rae. RAELS. A comprehensive constrained least squares refinement program. 1976. University of New South Yales, Kensington, New South Vales, 2033, Australial as the sum of two $180^{\circ}$ rotated orientations (about the Pt-C bond) of each of the two ring enantiomers. 2 has a similar phosphine ligand conformation to 1 (eclipsed) but, in contrast to 1 , contains ordered cyclohexenyl ligands.
09.4-1 THF CRYSTAL AND MOLECULAR STRIJCTURE OF CALCIUM BIPYRJDYL PICRATE. Ey V.S.Yadava and V.M. Padmanabhan, Heutron Physics Division, Bhabha Atomic Research Centre, Trombay, Bombay 400085 , India and N.S.Poonia, Chemistry Department, Devi Ahilya Vishwavidyalaya, Indore, India.

The title compound $\mathrm{CaC}_{32} \mathrm{H}_{10} \mathrm{O}_{14} \mathrm{H}_{20}$ crystallises in the orthorhombic space ${ }^{3}$ group ${ }^{20} \mathrm{P} 2,2,2$ with $a=$ 24.154, $b=16.12 \theta, c=18.068$ \& and $Z=4$. The structure is based on 3904 reflections collected with Trombay Computer-conlrolled four-circle diffractometer. The structure was solved by Patterson and Fourier methods and refined by least squares to an R-index of 0.068 . The calcium is eight coordinated to four nitrogens of bipyridyl rings and four oxygens of picrate groups forming the corners of a distorted cube. The ortho nitro groups of picrate are twisted out of the plane of the benzene fing while the para nitro group is nearly planar. The two pyridine rings of bipyridyl are slightly twisted.
09.4-2

CRYSTALLOGRAPHIC STUDIES OF LITHIUM HALIDE COMPLEXES WITH AROMATIC AMINES.
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A variety of structural types has been found in lithium halide complexes with substituted pyridines, closely related to the analogous copper series ${ }^{1-4}$, with amine-toItchium halide ratios of 3:1 (monomers), 2:1 (dimers), and 3:2 (a tetramer).

Examples of these types (bond lengths, angles degrees):
3:1

a $2.320(9) 2.51(2) 2.80(1)$
b $2.05(1) \quad 2.07(2) 2.02(2)-2.07(2)$
a 106.4(5) 108.8(9) 107.4(8)-113.1 (9)
B 112.4(4) 110.1(8) 107.6(7)-110.2(7)
2:1

$\mathrm{Cl} \quad \mathrm{Br} \quad \mathrm{I}$
average a $2.381(9) 2.564(7) 2.794(10)$
average b $2.09(1) 2.09(1) \quad 2.08(1)$
a 112.2(3) 115.0(3) 109.2(4)
average $\beta \quad 111.1(5) 110.1(4) 112.7(5)$
$\gamma \quad 101.7(2) 101.5(2) 100.1(3)$
○ $78.2(3) 78.4(2) \quad 79.9(3)$
$3: 2$


Average distances and selected angles for bromide:

| a | $2.54(2)$ | a | $109.6(7)$ |
| :--- | :--- | :--- | :--- |
| b | $2.16(1)$ | o | $127.6(7)$ |
| c | $2.61(1)$ | $\gamma$ | $97.5(5)$ |
| d | $2.65(2)$ | $\delta$ | $79.4(5)$ |
|  |  | $\varepsilon$ | $99.8(5)$ |

1:1


Stair polymer for chloride. ${ }^{5}$
(L=pyridine)

| a | $2.37(5)$ | a | $78(5)$ |
| :--- | :--- | :--- | :--- |
| b | $2.01(12)$ | B | $109(5)$ |

c $2.39(21) \quad \gamma 102(5)$

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