

### Preliminary communication

## OXIDATIVE ADDITION OF METHYL IODIDE TO BIS(PHENYL)- (CHELATE)PLATINUM(II) COMPLEXES

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(Received November 17th, 1975)

### Summary

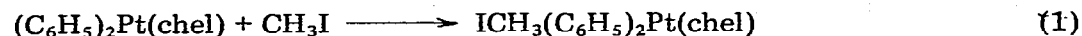
The oxidative addition of MeI to  $\text{Ph}_2\text{Pt}(\text{chel})$  (chel = bipy, phen) leads to  $\text{IMePh}_2\text{Pt}(\text{chel})$ ; these iodine complexes are very stable, and can be isolated and used for the synthesis of the stable complexes  $\text{XMePh}_2\text{Pt}(\text{phen})$ , via substitution reactions with thallium or silver salts MX (X = Cl, Br, CN, SCN, CNO,  $\text{N}_3$ ).

The oxidative addition of MeI to organoplatinum(II) complexes of the  $\text{R}_2\text{PtL}_2$  type readily takes place for R = alkyl, but not for R = aryl [1]. The formation of iodine complexes, such as  $\text{IPh}_2\text{MePtL}_2$  (L =  $\text{PPh}_2\text{Me}$ ), in solution was recently described [2], but the complexes could not be isolated because of decomposition to toluene and *trans*- $\text{IPhPtL}_2$ .

The different behaviour of alkyl and aryl platinum(II) complexes could be due to dissimilarities in the bonding of the platinum atom, which in aryl complexes acts [3] as both a  $\sigma$ - and  $\pi$ -donor. The oxidative addition of MeI would give rise to a decrease of the electron density on the platinum atom and in consequence to a weakening of its donor capacity.

The experiments described in refs. 1 and 2, were carried out with platinum(II) complexes with phosphine or arsine ligands. We have now examined the oxidative addition of MeI to complexes having ligands which are better  $\sigma$ -donors and worse  $\pi$ -acceptors, such as 1,10-phenanthroline and 2,2'-bipyridine.

The starting complexes  $(\text{C}_6\text{H}_5)_2\text{Pt}(\text{chel})$  were made by treating  $\text{Cl}_2\text{Pt}(\text{chel})$  with an excess of  $\text{C}_6\text{H}_5\text{MgBr}$  [4]. The complexes were added to stirred MeI at room temperature,

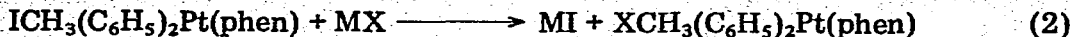


and the resulting products were obtained as yellow crystals, which are air-stable

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at room temperature and do not decompose below 200°C. All products gave satisfactory C, H and N analyses.

The iodine atom may be substituted by other halogens or pseudohalogens according to eq. 2. The reactions take place more quickly with silver salts,



(M = Tl, Ag; X = Cl, Br, CN, SCN, CNO, N<sub>3</sub>)

especially if these are freshly precipitated and moist.

The reported complexes are the first of this type. The azide complex is especially noteworthy, since only two other platinum(IV) azide complexes are known, viz.  $[\text{Pt}(\text{N}_3)_6]^{2-}$  and  $[\text{Me}_3\text{Pt}(\text{N}_3)]_4$  [5,6].

### References

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