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Organoplatinum(IV) Polymers

As hydrogen bonding can control the arrangement of molecules or ions in the solid state, it can be used in crystal engineering and in supramolecular synthesis. Some platinum coordination complexes contain hydrogen bonds, but little has been done with hydrogen bonding in organometallic platinum complexes.

Now, researchers at the University of Western Ontario in Canada have produced a series of organoplatinum(IV) complexes containing a range of functional groups which can take part in hydrogen bonding (C. S. A. Fraser, H. A. Jenkins, M. C. Jennings and R. J. Puddephatt, *Organometallics*, 2000, 19, (9), 1635–1642). The organoplatinum(IV) complexes were prepared by *trans*-oxidative addition of alkyl halide reagents RCH_2X ($X = Cl$ or Br) to $[PtMe_2(bu_2bipy)]$, $bu_2bipy = 4,4'$ -di-*tert*-butyl-2,2'-bipyridine. Dimers were formed via $OH\cdots O$ or $NH\cdots O$ hydrogen bonding, or polymers via $NH\cdots Cl$ hydrogen bonding. Further derivatives could be prepared by reacting the complexes formed with $AgBF_4$ in the presence of nicotinic acid or 4,4'-bipyridyl, and one of these, with two hydrogen-bonding groups, formed a polymer.

Extended structures can thus be designed with organoplatinum complexes via hydrogen bonding.