The heterometallic cluster Os6Pd(CO)18(bipy) has been isolated in moderate yield from the reaction of Os6(CO)18(MeCN)2 and (bipy)Pd(CO)Me2, and has been shown by a single crystal X-ray structure analysis to contain a monocapped octahedral metal core with the palladium occupying one vertex of the octahedron. Reaction of (bipy)Pd(CO)Me2 with H2O3(CO)18 affords Os6(CO)18(Pd(bipy))2 which exhibits an A-frame metal core. The unsaturated cluster H2Os6(CO)18 also reacts with trans-[P2V(C6H5)C]2 to give a range of mixed-metal clusters of palladium and osmium. All new clusters have been fully characterized by spectroscopic methods and crystallography. Some structural formulae of these mixed-metal clusters are shown in the following figure:

![Structural formulae of mixed-metal clusters](image)

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**Exotic Molecules-Organometallic**

**PS07.04.01 NOVEL LANTHANIDE PYRAZOLYL BORATE COMPLEXES WITH FAST DATA ACQUISITION AT LOW TEMPERATURE.** Mark R.J. Elsegood, Andrea Sella, Graham H. Mauder, and Sung-Ying Sung, Department of Chemistry, University of Newcastle-upon-Tyne, Newcastle-upon-Tyne, NE1 7RU, UK.

We present the structures of several lanthanide complexes containing sterically demanding poly(pyrazolyl)borate ligands. Such compounds show considerable potential in organic synthesis. Structural data are therefore vital in the understanding of structure-reactivity relationships.

Data were collected either on a state-of-the-art Siemens SMART area detector diffractometer, or on a Stoe-Siemens 4-circle instrument. Data sets are typically collected overnight on the SMART, aided by the excellent sensitivity of the CCD detector, rapid data read-out times, and high data redundancy.

Since many of the compounds are air and moisture sensitive, and frequently crystallise with solvent molecules included in their lattices, data are routinely collected at low temperature using a Siemens LT2 low temperature device (SMART), or a Cryostream Cooler (Stoe-Siemens). Previous attempts at collecting data at ambient temperatures were unsuccessful.

We present our latest results, including complexes of La, Sm, and Yb. The structure of [Sm(bis-pyrazolylborate)]-O-C-C(O)2Me(C6H5)1.5 C6H5, for example, illustrates the great benefits of rapid data collection at low temperature.

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Novel metal-carbene complexes (2) with a metallapentalene framework were obtained from 6-thiotetrazapentalenes (1) which contain a hypervalent N-S-N bond by treating with Pt(PPh3)4, Pd(PPh3)4, and Rh(PPh3)3Cl (Matsunura, et al. (1995) J. Am. Chem. Soc. 117, 3623). X-Ray investigations revealed that the central sulfur atom in 1 was substituted by a metal atom and that thioamide groups on one or both sides were rotated to form metal-sulfur bonds in the resultant metallapentalene framework. From the MO calculations on Frontier electron densities of the tetrazaphthalenies, 1, and the results of the structures of carbene complexes, we proposed the mechanism of the formation of these metal-carbene complexes. This mechanism suggests that starting compounds could be S-S-S or Se-Se-Se hypervalent systems instead of N-S-N hypervalent systems. In fact, recently we obtained metal complexes from diselenapentalenes. X-ray structure analyses revealed that these complexes were also novel metal-carbene complexes 4 coordinated by Se atoms. In this presentation, the structural features of diaza-tri-thi/sex屋-pentalenes (3) and metal-carbene complexes (4), as well as those of 2 and the reaction mechanism will be reported.

![Structures of metal-carbene complexes](image)

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**PS07.04.03 TOPOCHEMICAL AND HEAT-PHYSICAL PROPERTIES OF MoO2(C6H5CONH0)2 COMPLEX AND ITS CRYSTALLOSOLVATES.** L.K.Kim, Kh.T.Sharipov, V.P.Bruiskov, Institute of Chemistry, Tashkent, Uzbekistan

This study is devoted to the investigation of physical and chemical properties of MoO2(C6H5CONH0)2 complex and its crystallosolvates. The quantitative estimation of the energy of solvent molecules taring off complex molecule depending on structure of crystallosolvate and solvent nature is given. The dominant mechanism of crystallosolvates thermoddissociation kinetics in a 0.5-50% range of conversion amount has been determined. Ig A = E+b compensation effect relationship is established to be specific to the isostructural or similarly constructed coordinativ compounds.

In 270-320K temperature range with constant pressure in adiabatic regime the heat capacity of MoO2(C6H5CONH0)2 complex and its crystallosolvates have been measured. The polymorphs of the heat capacity equations have been calculated for the substances under study. The crystallosolvates thermodynamic parameters calculated have been compared with the kinetic ones of their topochemical dissociation and correlated with their packing types. On adsorption parameters of polar solvent (n-butanol and acetone) from unpolar medium (benzene) the comparative adsorptiv characteristics of the MoO2(C6H5CONH0)2 and WO2(C6H5CONH0)2 complexes are given. These substances are recommend as synthetic sorbents for unpolar solvents cleaning from minute quantities of polar ones.