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«Магнитно-резонансные методы исследования»

и кафедра физической органической химии

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Novel 1-D rhodium polymeric chain systems via rhodium-rhodium interactions

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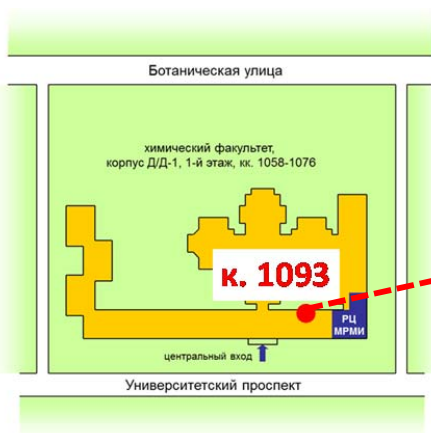
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Of interest to our research is the addition of metallophilic interactions to the arsenal library in the design of directionally orientated systems. The design of such systems has been highly motivated by the need for tuneable materials with unique magnetic, conducting, vapochromic and other properties that falls within a unique class of crystal engineering.

Metallophilic interactions occur when overlap arises between filled nd -orbitals, ns and np orbitals of transition metals such as gold, platinum, silver and rhodium. By facilitating these interactions metal centres are connected along one direction to form infinite 1-D metallic chains. In our research, rhodium(I) complexes containing β -diketonato ligands were investigated for metallophilic interactions. A wide range of complexes were investigated with $[\text{Rh}(\text{acac})(\text{CO})_2]$ systems (acac= acetylacetone) displaying short $\text{Rh}\cdots\text{Rh}$ interactions of 3.254(3) and 3.274(3) Å to complexes such as $[\text{Rh}(\text{4Cl-F}_3\text{bzac})(\text{CO})_2]$ (4Cl-F₃bzac= 1-(4-chlorophenyl)-4,4,4-trifluoro-1,3-butanedione) that contains ligands with greater steric bulk with Rh-Rh distances of 3.469(3) and 3.617(3) Å.

The question was raised in our research on whether the existence of these interactions could be predicted or whether they were a serendipitous occurrence in certain complexes. In our study the tailoring of ligand systems by altering electronic and steric properties allowed the manipulation of the metallophilic interactions which in turn resulted in altered physical properties of the materials. Additionally, it was observed that different crystallization conditions could result in changes in the assembly of molecules as illustrated with the isolated polymorph of $[\text{Rh}(\text{4Cl-F}_3\text{bzac})(\text{CO})_2]$ that displayed less diverse Rh-Rh distances of 3.523(3) and 3.593(3) Å. Several novel rhodium complexes will be presented that displayed these unique metallophilic interactions.



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Приглашаются все желающие

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