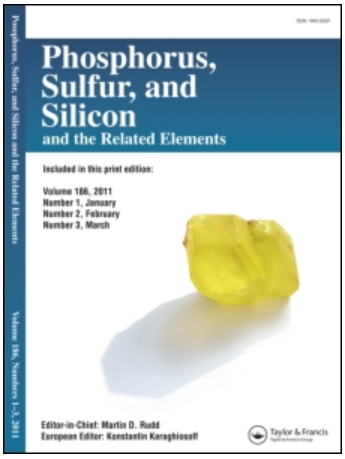

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Novel Copper (I) Trialkyl Trithiophosphite Complexes

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Novel Copper (I) Trialkyl Trithiophosphite Complexes

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The series of copper (I) complexes with thiophosphite ligands was prepared and examined to determine the factors that affect the coordination mode of the ligand with metal.

$(RS)_3P + CuX \rightarrow (RS)_3P \bullet CuX$ with X = Br, SCN, R = Et, Pr, Bu

The complex formation was confirmed by IR and NMR ^{31}P (in CH_3CN) spectroscopy, and X-ray analysis. The low-frequency shift of the P-S stretching vibration by 30-40 cm^{-1} in IR spectra of the complexes as compared to "free" thiophosphites was caused by the additional coordination of the sulfur atom as well as of phosphorus atom. The displacement of the phosphorus signal for coordination compounds in NMR spectra by 8 - 23 ppm in comparison with "free" ligands has also proved the complex formation.

As shown by X-ray analysis the complexes of copper (I) bromide and rhodanide with trialkylthiophosphites exhibit a bidentate coordination mode via two heteroatoms. Such type of coordination is assumed to be rather stable for the thiophosphite ligands. The $(EtS)_3P \bullet CuSCN$ complex appeared unstable when recrystallized from CH_3CN. In this case the ligand exchange has been observed.

The study of new copper(I) complexes with trialkylthiophosphite ligands has shown that a bidentate coordination mode is realised regardless of the length of the alkyl substituents at the sulfur atom and of the anion in copper(I) salt as well.

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