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Organophosphorus Ligands in Studies of Metal Complexes. Investigations of Ligand Exchange and Multielement Trace Analysis using Dithiophosphinic Ligands

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**Organophosphorus Ligands in Studies of Metal Complexes.
Investigations of Ligand Exchange and Multielement Trace
Analysis using Dithiophosphinic Ligands**

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On mixing organic solutions of $[\text{Et}_2\text{PS}_2]\text{M}/n$ and $[\text{Prop}_2\text{PS}_2]\text{M}/n$ [$\text{M} = \text{Pd(II)}$, Pt(II) , Rh(III) , Ir(III) , Cr(III)] an equilibrium is obtained containing statistical amounts of the corresponding mixed ligand complexes as can be shown by $^{31}\text{P}\{^1\text{H}\}$ -NMR, HPLC and FD-MS. With Pt(II) - and Pd(II) -chelates the kinetics of ligand exchange was determined by HPLC. Mixed complexes $\text{ML}_2\text{L}'$ and MLL'_2 were isolated from the equilibrium solutions in case of the more inert Cr(III) -, Rh(III) - and Ir(III) -chelates by preparative HPLC. Pd(II) , Pt(II) and Rh(III) can be determined quickly and simultaneously in aqueous solutions at nanogram level by complexation with $\text{Et}_2\text{PS}_2^\ominus$ in a modified sample loop followed by reversed phase HPLC.