

New rhodium(III) and ruthenium(II) water-soluble complexes with 3,5-diaza-1-methyl-1-azonia-7-phosphatricyclo[3.3.1.1^{3,7}]decane.

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The new water-soluble phosphine complexes of rhodium(III), $[\text{RhI}_4(\text{mtpa})_2]\text{I}$ (**1**), and ruthenium(II), $[\text{RuI}_4(\text{mtpa})_2]\cdot 2\text{H}_2\text{O}$ (**2**) and $[\text{RuI}_2(\text{mtpa})_3(\text{H}_2\text{O})]\text{I}_3\cdot 2\text{H}_2\text{O}$ (**3**) (mtpa = 3,5-diaza-1-methyl-1-azonia-7-phosphatricyclo[3.3.1.1^{3,7}]decane cation), have been prepared in the reactions of $\text{RhCl}_3\cdot 3\text{H}_2\text{O}$ and $\text{RuCl}_3\cdot 3\text{H}_2\text{O}$ in water in the presence of phosphine and potassium iodide. Properties and reactivity of the complexes have been investigated using ^1H and ^{31}P NMR and IR spectroscopies. The complexes have also been structurally characterized by single crystal X-ray diffraction studies. The compounds $[\text{RhI}_4(\text{mtpa})_2]\text{I}$ and $[\text{RuI}_4(\text{mtpa})_2]\cdot 2\text{H}_2\text{O}$ are zwitterionic octahedral complexes. The compounds were tested as catalysts for two-phase hydroformylation of 1-hexene and hydrogenation of cinnamaldehyde. Complex **1** is a selective catalyst for reduction of the CC bond while complexes **2** and **3** selectively hydrogenate the CO bond.

Adres publiczny

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Strona internetowa wydawcy

<https://www.acs.org/content/acs/en.html>