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Successive alkylation of Pt^{II} by RI to form bis-organoplatinum(IV) derivatives as key steps for cross-electrophile coupling

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This paper is devoted to Professor Irina P. Beletskaya, whose brilliant researches in the field of C-C and C-Element coupling reactions and their elegant applying in organic synthesis have shaped to a large extent the current state of organometallic catalysis.

Keywords: Pt^{II} iodo complexes; iodoacetone; oxidative addition; solvent specificity; C-C coupling

ABSTRACT

A solvent-specific reduction of Pt^{IV} iodo complexes into Pt^{II} by iodide ions was found: in acetone, Pt^{IV} iodo complexes are almost quantitatively reduced into Pt^{II}, and iodine, which is formed upon the reduction, is bound in a poorly soluble polymeric complex with NaI and acetone.

The revealed solvent-specific reduction of Pt^{IV} into Pt^{II} was used for sequential alkylation of Pt^{II} iodo complexes with iodoacetone to form mono-, bis-, and tris-acetonyl Pt^{IV} derivatives and also with iodoacetic acid to give mono- and bis- carboxymethyl Pt^{IV} complexes. The reaction of iodoacetic acid is accompanied by its catalytic reduction into acetic acid.

The organic ligands in the formed organoplatinum compounds are mutually *cis*, which is essential for further accomplishment of C-C coupling reactions.

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