as well as by plasma desorption mass spectrometry and elemental analysis.

Compound 2, m.p. 122—124 °C (decomp.). Found (%): C, 35.39; H, 5.31; Cl, 11.84; N, 4.80. $C_{18}H_{33}Cl_2N_2O_2PPt$. Calculated (%): C, 35.65; H, 5.48; Cl, 11.69; N, 4.62. IR spectrum ($CHCl_3$), ν/cm^{-1}: 320 (Pt—Cl). Mass spectrum (plasma desorption), *m/z* (I_{rel},%)): 570 $[M]^+$ (100).

Compound 3, m.p. 186—188 °C (decomp.). Found (%): C, 24.32; H, 4.03; Cl, 14.35; N, 5.77. $C_{10}H_{21}Cl_2N_2O_2PPt$. Calculated (%): C, 24.11; H, 4.25; Cl, 14.23; N, 5.62. IR spectrum ($CHCl_3$), ν/cm^{-1}: 336 and 294 (Pt—Cl).

In the ^{31}P NMR spectrum, as the signals of **2** disappear the low-field triplet (δP = 83.2 ppm, $^1J_{P,Pt}$ = 5562.5 Hz) increases. The proposed structure of **3** is also consistent with the ^{13}C NMR data ($CDCl_3$, δ, ppm, *J*/Hz): 74.2 (OCH_2, $^2J_{C,P}$ = 5.4) and 71.0 (OCH_2); 63.7 and 60.2 (NCH); 52.9 and 41.7 (NCH_2, $^2J_{C,P}$ = 7.3); 23.9 and 23.0 (CH_2); 10.1 and 9.8 (CH_3). The reaction of **1** with Pt(COD)Cl carried out at *ca.* 20 °C yielded a mixture of **2** and **3**.

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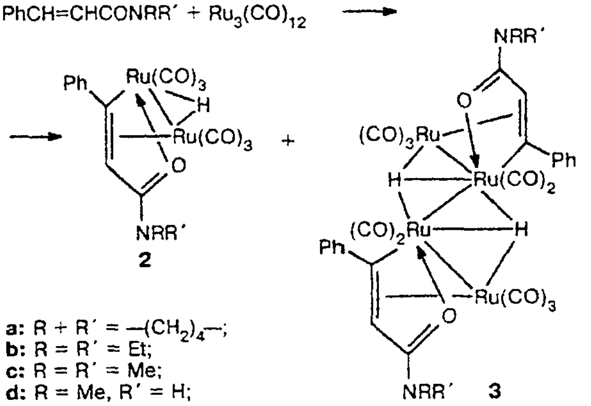
Reactions of $Ru_3(CO)_{12}$ with cinnamic acid amides

L. V. Rybin, N. A. Shtel'tser, M. I. Rybinskaya, and P. V. Petrovskii*

A. N. Nesmeyanov Institute of Organoelement Compounds, Russian Academy of Sciences,
28 ul. Vavilova, 117813 Moscow, Russian Federation.
Fax: 007 (095) 135 5085. E-mail: zakerz@ineos.ac.ru

It is known that reactions of $Ru_3(CO)_{12}$ with unsaturated ketones (oxadienes) lead to complexes comprising five-membered oxaruthenacycles as the main structural fragment, with additional η^3-coordination linkages to the other ruthenium atoms.[1,2] In this communication we describe the results obtained in reactions of $Ru_3(CO)_{12}$ with cinnamic acid amides. The latter are oxadienes containing amino substituents known to be potent electron-donating groups. We found that these reactions lead to a new type of tetranuclear complexes (**3**) along with the amino substituted analogs (**2**) of traditional binuclear complexes. Complexes **3** are produced by dimerization of complex **2** with elimination of two CO ligands and the formation of a bond between the oxaruthenacycles. It is interesting to note that the hydride atoms in **3** become unusual μ^3 bridges lying almost in the plane of the three ruthenium atoms. The structures assigned to **2** and **3** are based on preliminary X-ray results* and are consistent with the IR and NMR data. Thus **2a** has the following spectroscopic characteristics: IR spectrum (heptane), ν/cm^{-1}: 2098 m, 2052 vs, 2036 m, 2010 vs, 1990 s, 1974 m (C=O); ^1H NMR spectrum ($CDCl_3$, δ, ppm, *J*/Hz): 7.00—7.52 (m, 5 H, Ph); 3.16—3.44 (m, 4 H, CH_2); 2.91 (d, 1 H, *J* = 1.3); 1.80—2.00 (m, 4 H, CH_2); −12.58 (d, 1 H, *J* = 1.3, H—M). The IR spectrum of **3a** (tablet with KBr), ν/cm^{-1}: 2055, 2025, 1990, 1970, 1955 (C=O).

Using **2a** and **3a** as an example we studied the interconversion of the complexes. When heated in boiling heptane, complex **2a** is converted into **3a**. The reverse transformation of **3a** into **2a** takes place when **3a** is treated with methylene chloride and leads to partial decomposition of the complex.



a: R + R′ = —$(CH_2)_4$—;
b: R = R′ = Et;
c: R = R′ = Me;
d: R = Me, R′ = H;

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* X-ray diffraction analysis was performed by A. I. Yanovsky and F. M. Dolgushin (INEOS, RAS).

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1066-5285/97/4607-1360 $18.00

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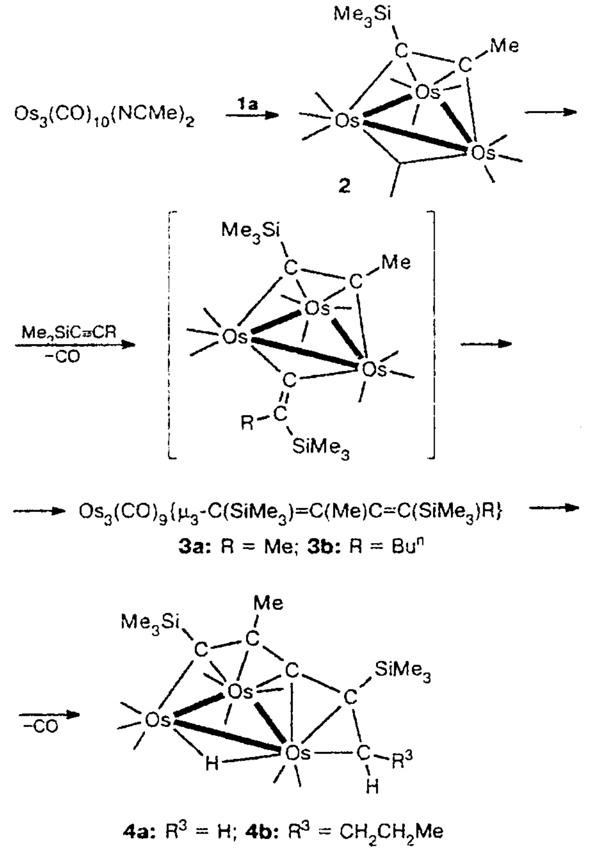
Alkyne—vinylidene coupling on a triosmium cluster. Formation of $Os_3(CO)_9\{\mu_3\text{-}C(SiMe_3)=C(Me)C=C(SiMe_3)R\}$complexes ($R$ = Me or Bu^n) containing an osmacyclobutene moiety

*A. M. Sheloumov, F. M. Dolgushin, A. I. Yanovskii, P. V. Petrovskii, and A. A. Koridze**

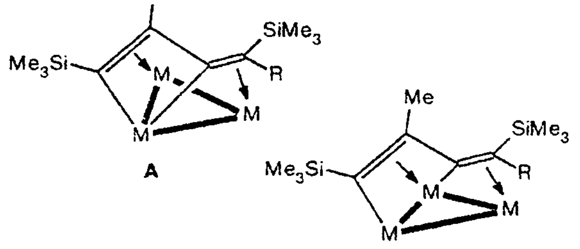
A. N. Nesmeyanov Institute of Organoelement Compounds, Russian Academy of Sciences,
28 ul. Vavilova, 117813 Moscow, Russian Federation.
Fax: 007 (095) 135 5085. E-mail: koridz@ineos.ac.ru

In connection with elucidating the mechanism of the dimerization of $Me_3SiC{\equiv}CMe$ (**1a**) and of its codimerization with alkynes $R^1C_2R^2$ on ruthenium and osmium clusters[1] we followed in detail the transformations of two silyl alkyne molecules on an Os_3 cluster under mild conditions. In the work we succeeded in isolating the reaction key intermediate, a red complex (**3a**). The ^1H and ^{13}C NMR spectra ($CDCl_3$, −45 °C, signals with relative intensity of 1, except as otherwise specified, δ_C, ppm: 0.57 (3 C), 2.47 (3 C), 29.67, 33.25, 51.53, 71.87, 126.33, 127.08, 170.15, 170.78, 173.11, 174.94, 175.77 (3 C), 177.86, 181.55) of cluster **3a** are temperature dependent. This is consistent with several dynamic processes occurring in the system.



4a: R^3 = H; **4b**: R^3 = CH_2CH_2Me

A comparison of the spectroscopic data for clusters **2**—**4a** and related clusters shows that the second **1a** molecule in the coupling undergoes rearrangement by a 1,2-shift of the Me_3Si group. In principle, the organic ligands of cluster **3a** can be bound to the Os_3 cluster in two modes, **A** and **B**. A type **A** structure with a metallacyclobutene moiety has never been observed in cluster chemistry. In contrast, a type **B** structure has been found for the cluster $Ru_3(\mu\text{-}H)(CO)_7(\mu\text{-}PPh_2)\{\mu_3\text{-}CH=C(Pr^i)C=CH_2\}$, which contains bridged hydride and phosphide ligands.[2]



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