Transfer of an aryl group from triphenylphosphine to a diruthenium species has been reported to take place along with a synergic joining of an oxygen atom from a bridging amide to the phosphorus atom.[25] Also, in the fast rhodium-catalyzed decomposition of triphenylphosphine in the presence of formaldehyde[26] we propose that the first step involves attack of the methoxy ligands at the coordinated phosphine. The rearrangement of **2** to **3** is the first well-defined case of an alkoxy ligand assisted phosphorus–carbon bond cleavage in a triarylphosphine. It shows that ortho metalation or cluster-assisted reactions are not necessarily involved in P–C bond cleavage. The present P–C/Pt–O metathesis may have been somewhat overlooked as a phosphine decomposition mode of homogeneous catalysts:[27,28] it may be especially important in syngas reactions where metal alkoxides are likely intermediates.

Registry No. **1**, 126135-74-8; **2**, 127973-52-8; **3**, 127973-53-9; **3**·C_7H_8, 127973-55-1; **4**, 127973-54-0; *o*-(diphenylphosphino)benzaldehyde, 50777-76-9; 1-phenyl-3*H*-2,1-benzoxaphosphole, 79157-82-7.

Supplementary Material Available: Details of the structure determination and listings of crystal data, positional and thermal parameters, and bond distances and angles for **3** (7 pages); a listing of observed and calculated structure factors for **3** (28 pages). Ordering information is given on any current masthead page.

---

(23) Kikukawa, K.; Takagi, M.; Matsuda, T. *Bull. Chem. Soc. Jpn.* **1979**, *52*, 1493.

(24) Sisak, A.; Ungváry, F.; Kiss, G. *J. Mol. Catal.* **1983**, *18*, 223.

(25) Chakravarty, A. R.; Cotton, F. A. *Inorg. Chem.* **1985**, *24*, 3584.

(26) Kaneda, K.; Sano, K.; Teranishi, S. *Chem. Lett.* **1979**, 821. In a typical reaction 0.05 mmol of $Rh_6(CO)_{16}$, 1 mmol of PPh_3, and 2.5 mmol of paraformaldehyde were heated at 80 °C under 6–8 bar of CO in dioxane (1% H_2O) for 24 h. Analysis showed that 1 mmol of benzaldehyde was formed. Phosphorus NMR spectra showed a variety of phenyl- and diphenylphosphorus oxide complexes or, more precisely, their formaldehyde adducts.

(27) A reviewer pointed out that there still is the possibility that a classical P–C(phenyl) bond splitting occurs, preceded by Pt–alkoxide dissociation, followed by attack of the alkoxide at the phosphido intermediate. Prolonged hydroformylation experiments did not show any P–C bond breaking of tris(*p*-tolyl)phosphine.[14]

(28) For a review on transition-metal-mediated phosphorus–carbon bond cleavage and its relevance to homogeneous catalysis see: (a) Garrou, P. E. *Chem. Rev.* **1985**, *85*, 171. Other examples of nucleophilic attack at coordinated phosphorus by oxo ligands have been reported: (b) Al-Jibori, S.; Hall, M.; Hutton, A. T.; Shaw, B. L. *J. Chem. Soc., Chem. Commun.* **1982**, 1069. (c) Beck, W.; Keubler, M.; Leidl, E.; Nagel, U.; Schaal, M.; Cenini, S.; Del Buttero, P.; Licandro, E.; Maiorana, S.; Chiesi Villa, A. *J. Chem. Soc., Chem. Commun.* **1981**, 446. (d) Bouaoud, S.-E.; Braunstein, P.; Grandjean, D.; Matt, D. *Inorg. Chem.* **1986**, *25*, 3765. (e) Alcock, N. W.; Bergamini, P.; Kemp, T. J.; Pringle, P. G. *J. Chem. Soc., Chem. Commun.* **1987**, 235.

Synthesis of Isomeric Complexes $(\mu\text{-H})W_2(CO)_7(RNC)_2(NO)$ (R = Me, ^{t}Bu, $PhCH_2$): X-ray Structures of $(\mu\text{-H})W_2(CO)_7(THF)_2(NO)$ and Isomeric $(\mu\text{-H})W_2(CO)_7(MeNC)_2(NO)$ with Bent Staggered/Eclipsed Conformations

Mei-Kuei Lee,[†] Ping S. Huang,[‡] Yuh S. Wen,[‡] and Jiann T. Lin*[,‡]

Chia-Nan Junior College of Pharmacy, Tainan, Taiwan, Republic of China,
Department of Chemistry, Chung-Yuan Christian University, Chung-Li, Taiwan, Republic of China,
and Institute of Chemistry, Academia Sinica, Taipei, Taiwan, Republic of China

Received February 22, 1990

Summary: Reactions of $(\mu\text{-H})W_2(CO)_9(NO)$ and $(\mu\text{-H})W_2(CO)_7(THF)_2(NO)$ with excess RNC (R = Me, ^{t}Bu, $PhCH_2$) afford the yellow complexes $(\mu\text{-H})W_2(CO)_7(RNC)_2(NO)$ and reddish isomers, respectively; X-ray structural studies on $(\mu\text{-H})W_2(CO)_7(THF)_2(NO)$ and an isomeric pair of $(\mu\text{-H})W_2(CO)_7(MeNC)_2(NO)$ complexes are described. The reddish isomers of the type $(\mu\text{-H})W_2(CO)_7(MeNC)_2(NO)$ exhibit bent, eclipsed conformations.

Transition-metal complexes with bridging hydride ligands have attracted considerable interest in the past.[1] It is believed that a linear M–H–M geometry is inherently less stable than a bent geometry since the latter permits a smaller M–M distance with a stronger 3c–2e bonding interaction.[2] A recent report suggested that the M–H–M bond can in fact be described as flexible in the case of carbonyl dimers with single hydrogen bridges.[3] To date only two complexes, $HCr_2(CO)_{10}^-$ and $HW_2(CO)_{10}^-$, have been found to have both carbonyl-staggered and carbonyl-eclipsed geometries,[2,4] however. We now report that both staggered and eclipsed conformations also exist in the isocyanide derivatives of $HW_2(CO)_9(NO)$,[5] $HW_2(CO)_7(RNC)_2(NO)$. Earlier we[6] characterized several phosphine-substituted derivatives of $HW_2(CO)_9(NO)$, all of which possess a bent W–H–W linkage with the equatorial groups staggered and the nitrosyl ligand occupying the axial position on the phosphine-substituted tungsten, similar to the case for $HW_2(CO)_8(P(OMe)_3)(NO)$.[7]

Reaction of $HW_2(CO)_9(NO)$ with excess RNC (R = Me, ^{t}Bu, $PhCH_2$) in CH_2Cl_2 at 25 °C for 3 h affords, after subsequent workup, the yellow complexes $(\mu\text{-H})W_2(CO)_7(RNC)_2(NO)$ in 33, 36, and 6% yields for R = ^{t}Bu

---

[†] Chia-Nan Junior College of Pharmacy.

[‡] Chung-Yuan Christian University and Academia Sinica.

(1) E.g.: (a) Dahl, L. F. In *Catalytic Transition Metal Hydrides*; New York Academy of Science: New York, 1983; Part I. (b) Venanzi, L. M. *Coord. Chem. Rev.* **1982**, *43*, 251 and references cited therein.

(2) (a) Bau, R.; Koetzle, T. F. *Pure Appl. Chem.* **1978**, *50*, 55. (b) Bau, R.; Teller, R. G.; Koetzle, T. F. *Acc. Chem. Res* **1979**, *12*, 176.

(3) Jezowska-Trzebiatowska, B.; Nissen-sobocinska, B. *J. Organomet. Chem.* **1987**, *322*, 331.

(4) (a) Petersen, J. L.; Brown, R. K.; Williams, J. M.; McMullan, R. K. *Inorg. Chem.* **1979**, *18*, 3493. (b) Roziere, J.; Williams, J. M.; Stewart, R. P., Jr.; Petersen, J. L.; Dahl, L. F. *J. Am. Chem. Soc.* **1977**, *99*, 4497. (c) Wilson, R. D.; Graham, S. A.; Bau, R. *J. Organomet. Chem.* **1975**, *91*, C49. (d) Handy, L. B.; Ruff, J. K.; Dahl, L. F. *J. Am. Chem. Soc.* **1970**, *92*, 7312. (e) Handy, L. B.; Treichel, P. M.; Dahl, L. F.; Hayter, R. G. *J. Am. Chem. Soc.* **1966**, *88*, 366.

(5) Olsen, J. P.; Koetzle, T. F.; Kirtley, S. W.; Andrews, M.; Tipton, D. L.; Bau, R. *J. Am. Chem. Soc.* **1974**, *96*, 6621.

(6) Lin, J. T.; Wang, S. Y.; Huang, P. S.; Hsiao, Y. M.; Wen, Y. S.; Yeh, S. K. *J. Organomet. Chem.*, in press.

(7) Love, R. A.; Chin, H. B.; Koetzle, T. F.; Kirtley, S. W.; Whittlesty, B. R.; Bau, R. *J. Am. Chem. Soc.* **1976**, *98*, 4491.

0276-7333/90/2309-2181$02.50/0

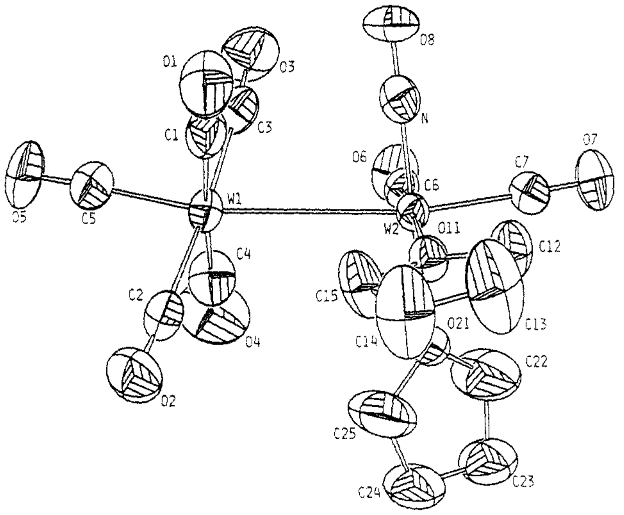


Figure 1. Molecular structure of 7. Important bond lengths (Å): W(1)-W(2) = 3.418(1), W(1)-C(1) = 2.038 (9), W(1)-C(2) = 2.049 (9), W(1)-C(3) = 2.023 (9), W(1)-C(4) = 2.013 (9), W(1)-C(5) = 1.968 (9), W(2)-N = 1.825 (7), W(2)-O(11) = 2.216 (5), W(2)-O(21) = 2.205 (5), W(2)-C(6) = 1.908 (8), W(2)-C(7) = 2.002 (8). Important bond angles (deg): W(2)-N-O(8) = 177.6 (6), W(2)-O-(11)-C(12) = 122.7 (4), W(2)-O(11)-C(15) = 128.1 (4), W(2)-O-(21)-C(22) = 124.9 (6), W(2)-O(21)-C(25) = 129.9 (6).

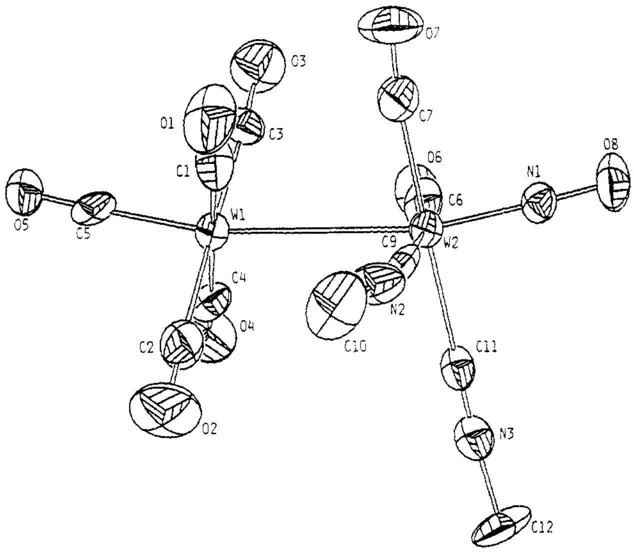


Figure 2. Molecular structure of 2. Important bond lengths (Å): W(1)-W(2) = 3.389 (1), W(1)-C(1) = 2.06 (2), W(1)-C(2) = 2.07 (3), W(1)-C(3) = 1.96 (2), W(1)-C(4) = 2.00 (2), W(1)-C(5) = 1.95 (2), W(2)-N(1) = 1.83 (2), W(2)-C(6) = 2.00 (2), W(2)-C(7) = 2.03 (2), W(2)-C(9) = 2.19 (2), W(2)-C(11) = 2.18 (2), N(2)-C(9) = 1.12 (3), N(3)-C(11) = 1.13 (3). Important bond angles (deg): W(2)-N(1)-O(8) = 173 (2), W(2)-C(9)-N(2) = 170 (2), C(9)-N-(2)-C(10) = 177 (2), W(2)-C(11)-N(3) = 176 (2), C(11)-N(3)-C(12) = 175 (2), N(1)-W(2)-C(9) = 97.4 (7), N(1)-W(2)-C(11) = 89.5 (7), N(1)-W(2)-C(6) = 93.5 (8), N(1)-W(2)-C(7) = 89.3 (8).

(1), R = Me (2), and R = $PhCH_2$ (3), respectively. Much lower yields of red isomers are also obtained: a 4% yield for R = ${}^tBu$ (4) and trace amounts for R = Me (5) and R = $PhCH_2$ (6).[8] However, with $(\mu\text{-H})W_2(CO)_7(THF)_2(NO)$ (7) instead of $HW_2(CO)_9(NO)$ as starting material, the red isomers can be isolated in much higher yields (82, 88, and 67%, respectively).[9] The orange starting material 7 can

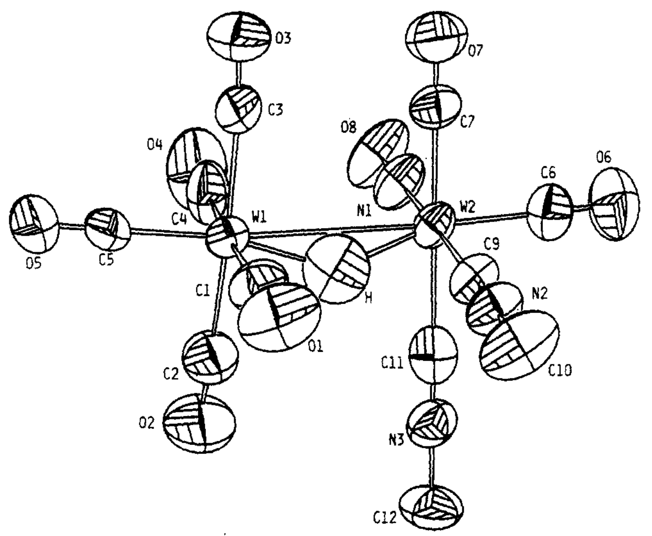


Figure 3. Molecular structure of 5. Important bond lengths (Å): W(1)-W(2) = 3.4800 (9), W(1)-C(1) = 2.04 (2), W(1)-C(2) = 2.01 (1), W(1)-C(3) = 2.03 (1), W(1)-C(4) = 1.98 (2), W(1)-C(5) = 1.94 (1), W(1)-H = 1.8 (1), W(2)-N(1) = 1.84 (1), W(2)-C(6) = 1.99 (1), W(2)-C(7) = 1.99 (1), W(2)-C(9) = 2.18 (1), W(2)-C(11) = 2.17 (2), W(2)-H = 1.8 (1). Important bond angles (deg): W-(2)-N(1)-O(8) = 178 (1), W(2)-C(9)N(2) = 178 (1), W(2)-C-(11)-N(3) = 174 (1), C(9)-N(2)-C(10) = 177 (1), C(11)-N(3)-C(12) = 179 (2), W(1)-H-W(2) = 143 (7).

be conveniently prepared from the reaction of $HW_2(CO)_9(NO)$ with THF at room temperature in 76% yield.

The structures of 7, 2, and 5 in the solid state were characterized by X-ray diffraction studies,[10] and ORTEP drawings are shown in Figures 1–3, respectively. The metal–metal distances (7, 3.418 (1) Å; 2, 3.389 (1) Å; 5,

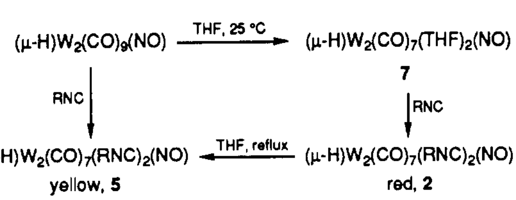
---

[8] The crude residue was chromatographed on silica gel column under nitrogen. Careful elution with hexane and then with CH_2Cl_2/hexane (1:4) served to remove the yellow band, which was evaporated to yield the yellow product 1 (or 2, 3). Further elution with CH_2Cl_2/hexane (1:1) gave the red product 4 (or 5, 6).

[9] The new complexes were identified by satisfactory elementary analyses and by IR and ${}^1H$ NMR spectroscopy. Selected data (IR in CH_2Cl_2, NMR in acetone-d_6 with coupling constants in Hz): 1, ν(CN) at 2190 w and 2170 w cm^{-1}, ν(CO) at 2065 w, 2028 s, 1977 s, and 1925 vs cm^{-1}, ν(NO) at 1648 m cm^{-1}; ${}^1H$ NMR δ 1.86 (s, 18 H) and −12.6 (s with satellites, J = 32, 43; 1 H); 2, ν(CN) at 2220 w and 2201 w cm^{-1}, ν(CO) at 2067 w, 2033 s, 1980 s, and 1926 vs cm^{-1}, ν(NO) at 1651 m cm^{-1}; ${}^1H$ NMR δ 3.88 (s, 6 H) and −12.6 (s with satellites, J = 32, 43; 1 H); 3, ν(CN) at 2204 w and 2183 w cm^{-1}, ν(CO) at 2066 w, 2032 s, 1982 s, and 1925 vs cm^{-1}, ν(NO) at 1655 m cm^{-1}; ${}^1H$ NMR δ 7.63–7.54 (m, 10 H), 5.55 (s, 4 H), and −12.3 (s with satellites, J = 34, 43; 1 H). 4, ν(CN) at 2202 w and 2179 w cm^{-1}, ν(CO) at 2063 w, 2019 s, 1949 s, 1925 vs, and 1896 sh cm^{-1}, ν(NO) at 1682 m cm^{-1}; ${}^1H$ NMR δ 1.78 (s, 9 H), 1.69 (s, 9 H), and −9.56 (s with satellites, J = 42, 50; 1 H). 5, ν(CN) at 2230 w and 2210 w cm^{-1}, ν(CO) at 2064 w, 2022 s, 1947 s, 1921 vs, and 1892 sh cm^{-1}, ν(NO) at 1688 m cm^{-1}; ${}^1H$ NMR δ 3.88 (s, 3 H), 3.78 (s, 3 H), and −9.49 (s with satellites, J = 44, 53; 1 H); 6, ν(CN) at 2217 w, 2188 w cm^{-1}, ν(CO) at 2064 w, 2021 s, 1951 s, 1924 vs, and 1900 sh cm^{-1}, ν(NO) at 1685 m cm^{-1}; ${}^1H$ NMR δ 7.44–7.24 (m, 10 H), 5.11 (s, 2 H), 4.86 (s, 2 H), and −9.46 (s with satellites, J = 41, 54; 1 H); 7, ν(CO) (in THF) at 2064 w, 2002 m, 1969 w, 1928 vs, and 1904 m–s cm^{-1}, ν(NO) at 1662 m cm^{-1}, ${}^1H$ NMR δ 4.61–4.23 (m, 4 H), 4.05–3.92 (m, 4 H), 2.20–2.10 (m, 4 H), 2.08–1.96 (m, 4 H), and −5.21 (s with satellites, J = 50, 60; 1 H).

[10] Crystals of complexes 2 and 5 suitable for X-ray diffraction measurements were grown by cooling a concentrated solution of the complex in CH_2Cl_2/hexane (1:5) at −5 °C for several days. Crystals of complex 7 were grown by slow diffusion of hexane into a concentrated solution of 7 in THF. Crystal data for 2: $C_{11}H_6N_3O_8W_2$, M_r = 675.9, orthorhombic, space group $Pna2_1$, a = 13.402 (3) Å, b = 8.386 (1) Å, c = 15.510 (2) Å, V = 1743.2 (5) Å^3, Z = 4, D_c = 2.58 g cm^{-3}, $F(000)$ = 1223.5, graphite-monochromated Mo Kα X-radiation (λ = 0.709 30 Å), μ(Mo Kα) = 13.51 mm^{-1}. The structure was solved by heavy-atom methods and refined by least squares to R = 0.030 for 1569 unique, observed reflections ($I > 2.0\sigma(I)$), absorption-corrected intensities with $0 < 2\theta < 56.8°$, collected on a Enraf-Nonius CAD-4 diffractometer. 5: $C_{11}H_6N_3O_8W_2$, M_r = 675.9, triclinic space group $P\bar{1}$, a 8.457 (2) Å, b = 8.6284 (9) Å, c = 12.757 (1) Å, α = 90.789 (8); β = 96.34 (1), γ = 104.99 (1)°, V = 892.8 (3) Å^3, Z = 2, D_c = 2.51 g cm^{-3}, $F(000)$ = 305.9, μ(Mo Kα) = 6.60 mm^{-1}, R = 0.027 for 2206 unique, observed reflections ($I > 2.0\sigma(I)$), $\omega < 2\theta < 49.8°$. 7: $C_{15}H_{16}NO_{10}W_2$, M_r = 737.7, triclinic, space group $P\bar{1}$, a = 8.454 (2) Å, b = 9.396 (2) Å, c = 14.951 (3) Å, α = 97.68 (2)°, β = 98.99 (2)°, γ = 113.48 (3)°, V = 1050.4 (4) Å^3, Z = 2, D_c = 2.33 g cm^{-3}, $F(000)$ = 683.8, μ(Mo Kα) = 11.23 mm^{-1}, R = 0.023 for 2941 unique, observed reflections ($I > 2.5\sigma(I)$), $0 < 2\theta < 49.8°$.

Scheme I



3.4800 (9) Å) are somewhat longer than that in $HW_2(CO)_9(NO)$ (3.329 (1) Å)[5] or in the unsupported complex $Cp_2W_2(CO)_6$ (3.222 (1) Å).[11] To our knowledge, compound 7 is the first structurally characterized tungsten(0) complex that contains THF ligands. The following structural features for 7 are all very similar to those in disubstituted phosphine derivatives[6] of $HW_2(CO)_9(NO)$: (a) the two tungsten atoms with a W–H–W linkage reside in roughly octahedral environments, (b) the overall structure is bent (with the framework bend[12] of 23.9 (2)°) and the equatorial groups are staggered, and (c) the two mutual cis THF ligands are coordinated to the tungsten atom containing the NO ligand and occupy the equatorial exo positions which are less sterically hindered. However, the NO ligand is trans to one of the THF ligands instead of being in the axial position. The overall structure of 2 closely resembles that of 7 except that the NO ligand is in the axial position. It has a framework bend of 24.9 (7)° and an average degree of staggering at 45 (2)°. Complex 5 has an almost perfect eclipsed conformation with an average torsional angle of 2 (1)°. The two MeNC ligands are also mutually cis, and the NO ligand resides in an equatorial site. Unlike the complexes $[Et_4N][HCr_2(CO)_{10}]$,[4b] $[Et_4N][DCr_2(CO)_{10}]$,[4a] and $[Et_4N][HW_2(CO)_{10}]$,[4c] molecule 5 is not subjected to crystallographic symmetry constraints, and its slightly bent structure (8.4 (4)° for the framework bend) is unambiguous. The position of μ-H in 2 was located in the final difference Fourier maps and refined. The observed W–H distances (1.8 (1) Å) are in good agreement with the reported values (1.8–1.9 Å) for the analogous complexes, and the W–H–W angle (143 (7)°) appears to be larger than those frequently observed (115–135°).[2b] The interatomic distances between equatorial ligands on the halves of the dimer are as follows: C(2)–C(11), 3.79 Å; C(1)–C(9), 3.42 Å; C(4)–N(1), 3.32 Å; C(3)–C(7), 3.22 Å. Dahl suggested that interatomic van der Waals forces caused the conformational change in the $HCr_2(CO)_{10}^-$ and $Cr_2(CO)_{10}^{2-}$ anions,[4d] whether the different conformations in the isomeric pair 2, 5 can be accounted for solely by the same factor will be the subject of future study.

The spectroscopic properties[9] for complexes 1–7 are consistent with their formulation. Being trans to CO and NO, respectively, the two RNC or THF ligands in 4–7 are magnetically inequivalent in the ^1H NMR spectra, in contrast to those in 1–3.

In refluxing THF solution, complex 5 is converted to 2 completely within 5 h, whereas there is no interconversion between the two under ambient conditions. Apparently the isomeric complexes form from $HW_2(CO)_{10}(NO)$ via different pathways. Whether cleavage of the W–H–W linkage occurs in any aforementioned reactions is not clear at present. Our successful isolation of $W(CO)_5(py)$ from the reaction of $HW_2(CO)_9(NO)$ with pyridine indicates that cleavage of the dimer might occur in certain circumstances.

The principal reactions in this study are summarized in Scheme I. The synthetic application of these new complexes is currently under investigation. Our preliminary results indicate that complex 7 can initiate the polymerization of norbornadiene and 2,3-dihydrofuran. Treatment of 3 with iodine results in the formation of *cis*-$(^tBuNC)_2W(CO)_2(NO)I$, reported by King.[13]

Acknowledgment. We wish to thank the National Science Council of the Republic of China for support and Professor M. Y. Darensbourg for helpful discussions.

Registry No. 1, 127973-56-2; 2, 127973-57-3; 3, 127973-58-4; 4, 128050-99-7; 5, 128051-00-3; 6, 128051-01-4; 7, 127973-59-5; $HW_2(CO)_9(NO)$, 40270-21-1; $W(CO)_5(py)$, 14586-49-3; *cis*-$(^tBuNC)_2W(CO)_2(NO)I$, 52699-24-8; MeNC, 593-75-9; ^tBuNC, 7188-38-7; $PhCH_2NC$, 10340-91-7; norbornadiene, 121-46-0; 2,3-dihydrofuran, 1191-99-7.

Supplementary Material Available: Tables of atomic coordinates, all bond distances and angles, and anisotropic thermal parameters for 2, 5, and 7 and a table of elemental analyses for 1–7 (12 pages); tables of structure factors for 2, 5, and 7 (45 pages). Ordering information is given on any current masthead page.

---

(11) Wisson, F. C.; Shoemaker, D. P. *Naturwissenschaften* 1956, *43*, 57.

(12) The framework bend is defined as the dihedral angle between the two least-squares planes through the two sets of equatorial ligands. For example, atoms W(1), C(1), C(2), C(3), and C(4) in 2 constitute one of the planes, and atoms W(2), C(6), C(7), C(9), and C(11) constitute the other.

(13) King, R. B.; Saran, M. S.; Anand, S. P. *Inorg. Chem.* 1974, *13*, 3038.

Nucleophilic Attack of Pentacarbonylrhenate(−I) on Sulfur: Formation of the Doubly Bridged Tetrasulfido Dimer $[(OC)_3Re(\eta^2\text{-}S_4)]_2^{2-}$

T. S. Andy Hor,[1] Barbara Wagner, and Wolfgang Beck*

Institut für Anorganische Chemie, Universität München, Meiserstrasse 1, 8000 München 2, FRG

Received February 22, 1990

Summary: The title complex is formed by addition of pentacarbonylrhenate(−I) to elemental sulfur and has been characterized by X-ray diffraction.

The nucleophilicity of metalates is well documented in the literature.[2] As part of our continuing effort to examine

---

* To whom correspondence should be addressed.

(1) Alexander von Humboldt Fellow, 1989–1990. Present address: Department of Chemistry, Faculty of Science, National University of Singapore, Kent Ridge, Singapore 0511.

(2) (a) Dessy, R. E.; Pohl, R. L.; King, R. B. *J. Am. Chem. Soc.* 1966, *88*, 5121. Lai, C.-K.; Feighery, W. G.; Zhen, Y.; Atwood, J. D. *Inorg. Chem.* 1989, *88*, 3929. (b) Pearson, R. G.; Figdore, P. E. *J. Am. Chem. Soc.* 1980, *102*, 1541. (c) Casey, C. P.; Audett, J. D. *Chem. Rev.* 1986, *86*, 339. (d) Henderson, S.; Henderson, R. A. *Adv. Phys. Org. Chem.* 1987, *23*, 1.

0276-7333/90/2309-2183$02.50/0 © 1990 American Chemical Society