



Figure 1. ORTEP drawing of the molecule $[\text{Pt}_3\text{Hg}(\mu_2\text{-CO})_3(\text{PPh-}i\text{-Pr}_2)_3]_2$. Carbon atoms of the phosphine ligands have been omitted for clarity. Some relevant bond lengths (Å) and angles $^\circ$ are as follows (av—average value; the \pm sign where given refers to the mean-square deviation from the mean): Hg—Hg', 3.225 (1); Hg—Pt(1), 2.968 (1); Hg—Pt(2), 2.931 (1); Hg—Pt(3), 3.084 (1); Pt(1)—Pt(2), 2.661 (1); Pt(1)—Pt(3), 2.651 (1); Pt(2)—Pt(3), 2.662 (1); Pt—P(av), 2.257 ± 0.15 (5); Pt—C(av), 2.05 ± 0.03 (2); P—C(av), 1.83 ± 0.03 (2); C—O(av), 1.20 ± 0.005 (3); Pt(1)—Hg—Pt(3), 51.92 (2); Pt(1)—Hg—Pt(2), 53.63 (2); Pt(2)—Hg—Pt(3), 52.46 (2); Pt(1)—Pt(2)—Pt(3), 59.74 (2); Pt(1)—Pt(3)—Pt(2), 60.12 (2); Pt(2)—Pt(1)—Pt(3), 60.14 (2).

are at a distance of 3.225 (1) Å. It is noteworthy that in metallic mercury the crystalline α form has each Hg atom surrounded by six nearest neighbors at 2.99 Å and another six at 3.47 Å. It should also be noted that the Hg—Hg distances in the Hg_2X_2 salts for X = halide are 2.49–2.51 Å.⁴ The two halves of the molecule are related through a center of symmetry, and thus, the two Pt_3 units are staggered. Each mercury atom lies above a Pt_3 triangle, with nonequivalent Pt—Hg distances ranging from 2.932 to 3.084 (1) Å. The bond distances within the Pt_3 triangles are non-equivalent and slightly longer than those found for $[\text{Pt}_3(\mu_2\text{-CO})_3(\text{PCy}_3)_3]$, **3** (2.655 ± 0.002 Å, average value), and comparable with the basal Pt—Pt separation in $[\text{Pt}_3(\mu_2\text{-CO})_3(\text{PCy}_3)_4]$, **4** (2.675 (1) Å).⁶ The carbonyl ligands are symmetrically bridging and are bent away from the mercury atoms (mean deviation of the oxygen atoms from the least-squares planes defined by the Pt_3 triangles: 0.54 Å).

Compounds $[\text{Pt}_3\text{Hg}(\mu_2\text{-CO})_3(\text{P-}i\text{-Pr}_3)_3]_2$, **5**, and $[\text{Pt}_3\text{Hg}(\mu_2\text{-CO})_3(\text{PEt}_2\text{-}i\text{-Bu})_3]_2$, **6**, were also prepared as described for **2**. ³¹P, ¹⁹⁵Pt, and ¹⁹⁹Hg NMR studies show that, in toluene solution, the mixed-metal clusters are still fluxional down to ca. -90 °C. The ³¹P and ¹⁹⁵Pt NMR spectra, however, are very similar to those found for the parent Pt_3 cluster **1**, suggesting that the fluxional process is associated with the mercury atoms.

The solid-state structure of **2** indicates that there is a weak Hg—Hg interaction. The bonding between this unit and the Pt_3 fragments can be described, to a first approximation, by a linear combination of (1) one empty σ -type orbital of one of the coordinatively unsaturated Pt_3 fragments, (2) the filled 6s orbital of one mercury atom, (3) the 6s orbital of the other mercury atom, and (4) the empty σ -type orbital of the second Pt_3 fragment. This gives rise to one strongly bonding and one weakly bonding molecular orbital that accommodate the four bonding electrons. The weak Hg—Hg interaction arises from the nonbonding character between these two atoms of the HOMO.

It is noteworthy that the reaction of $[\text{Pt}_4(\mu_2\text{-CO})_5(\text{PET}_3)_4]$ with metallic mercury⁷ gives a compound of the composition $\{\text{Hg}[\text{Pt}_3(\mu_2\text{-CO})_3(\text{PET}_3)_3]_2\}$, **7**, which could be similar to $\{\text{Hg}[\text{Pt}_3(\mu_2\text{-}2,6\text{-Me}_2\text{C}_6\text{H}_3\text{NC})_3(2,6\text{-Me}_2\text{C}_6\text{H}_3\text{NC})_3]_2\}$,⁸ in which a single mercury atom is sandwiched between the two Pt_3 triangles.

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Registry No. **1**, 77760-50-0; **2**, 83803-81-4; **5**, 83781-26-4; **6**, 83781-27-5; **7**, 83801-82-5; Hg, 7439-97-6; Pt, 7440-06-4; $[\text{Pt}_4(\mu_2\text{-CO})_5(\text{PET}_3)_4]$, 83781-28-6.

Supplementary Material Available: Final positional and thermal parameters for **2** (Table I) and anisotropic temperature factors for **2** (Table II) (3 pages). Ordering information is given on any current masthead page.

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Book Reviews*

Organic Electronic Spectral Data. Volume XVII. Edited by J. P. Phillips, D. Bates, H. Fever, and B. S. Thyagarajan. John Wiley & Sons, New York. 1981. xiii + 1060 pp. \$100.00.

With this volume, nearly 400 000 UV—vis spectra have been recorded in this series, which began in 1956. It now appears annually; this volume includes data from the literature published in 1975. The data given consist of the wavelength maxima with the corresponding extinction coefficients, the solvent in which the spectrum was measured, and the reference to the original source. The material is arranged in tabular form in formula-index order; the specific compound is identified by its name in Chemical Abstracts style.

100 Jahre Beilstein: 1881–1981. Beilstein Institut, Varrentrappstrasse 40–42, D-6000 Frankfurt 90, FRG. 1981. 128 pp. Gratis.

This charming *Festschrift* may be obtained free of charge, so long as a small supply lasts, by writing to the Institut. It is a valuable contribution to the history of chemistry and contains photographs of notables in the development of "Beilsteins Handbuch der Organischen Chemie", beginning with Friedrich Konrad Beilstein. He began compiling, as early

as 1860, the data for what was to become the Handbuch. That edition, which appeared in the period 1880–1883, contained only about 15 000 compounds. The Handbuch soon outgrew the abilities of a single editor, and as organic chemistry has burgeoned, the preparation of "Beilstein" has passed successively to a pair of editors, an editorial team, and finally to the Beilstein Institut, a foundation with its own large building and staff of about 150 full-time professionals.

The content of "Beilstein" has also evolved with its subject, although its guiding principle has endured: to list every known organic compound, with a concise but critically examined summary of the physical and chemical properties of each, accompanied by the pertinent references. It remains the only complete source of such information, which is contained in over 240 volumes and 200 000 pages so far. New volumes in the IVth supplement appear at the rate of about 17 per year. Its completion is expected in 1985, and the IVth supplement, which will bring the coverage close to present times, is already in active preparation. It will embody a major change: it will be produced in English.

The value of "Beilstein" as an archive of information is generally known, but its special and unique features are not widely understood and appreciated as they should be. The fact that all the information on one compound can be found in one place has several advantages: it saves one the sometimes great effort and time of assembling the scattered primary

* Unsigned book reviews are by the Book Review Editor.

sources; it alleviates the problem of being faced with an original that may be in an incomprehensible language; and it is a protection against the possibility of having missed an important piece of information, such as can easily happen when one makes a search on one's own. Less generally realized is the value of the critical evaluation to which the data in "Beilstein" are subjected. Conflicting reports are resolved, sometimes by direct contact with the original authors. Old structures are revised when new structural information on a key compound is reported, such as in the stereochemistry of natural products. In this way, information is incor-

porated in "Beilstein" that cannot be found in any of the original literature.

From its start with a 20-page chronicle of important events in organic chemistry to the concluding remarks by the present Editor-in-Chief, Dr. Reiner Luckenbach, this little book is enjoyable to read. Although the history of "Beilstein" and the description of its present status are the heart of the book, the ceremonial aspects of the several addresses that graced the centennial celebration can also be appreciated, and the book is a worthy record of an important milestone for organic chemistry.