

Synthesis and characterization of the complexes of trimethylplatinum(IV) iodide with some ditellurides and ditelluroethers: the crystal structure of $[(\text{PtI}(\text{Me})_3)_2(p\text{-MeOC}_6\text{H}_4\text{Te})_2]$

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Abstract

Trimethylplatinum(IV) iodide reacts with ditellurides, R_2Te_2 , to give bimetallic complexes of the type $[(\text{PtI}(\text{Me})_3)_2(\text{Te}_2\text{R}_2)]$ ($\text{R} = \text{Me}, p\text{-MeOC}_6\text{H}_4, p\text{-EtOC}_6\text{H}_4$). Ditelluroethers, RTeCH_2TeR , react with trimethylplatinum(IV) iodide to give the bimetallic complex $[(\text{PtI}(\text{Me})_3)_2\text{RTeCH}_2\text{TeR}]$ ($\text{R} = p\text{-MeOC}_6\text{H}_4$) or the mononuclear complexes, $[(\text{PtI}(\text{Me})_3)(\text{RTeCH}_2\text{TeR})]$ and $[(\text{PtI}(\text{Me})_3)(\text{RTeCH}_2\text{TeR})_2]$ ($\text{R} = \text{C}_6\text{H}_5$). The crystal structure of $[(\text{PtI}(\text{Me})_3)_2(p\text{-MeOC}_6\text{H}_4\text{Te})_2]$ has been determined.

Key words: Platinum; Iodide; Ditelluride; Ditelluroether; Crystal structure

1. Introduction

Although there has been much progress in synthesis and characterization of the coordination complexes of organotellurium ligands, complexes of bidentate and polydentate ligands are scarce [1]. Recently several ditelluroethers [2,3], hybrid bidentate, and polydentate tellurium ligands [4] have become available. Complexes of the 'class b' transition metal halides with these ligands have generally been found to be sparingly soluble in common organic solvents [5] and poorly crystalline, making their satisfactory characterization difficult. On the other hand the complexes of organotransition metal acceptors with bidentate ligands are generally crystalline, and soluble in common organic solvents [6].

Very few well characterized complexes of the ditellurides [7] and ditelluroethers in which these act in a

bidentate mode have been reported. Recently, however, Abel and co-workers have reported the synthesis and dynamic NMR studies of the complexes of diphenylditelluride, 1,3-ditelluropropane, and *o*-phenylene bis(telluroether) with trimethylplatinum halides [8,9].

As part of our studies of organotellurium ligands we report below the synthesis and characterization of the complexes of some ditellurides and 1,3-ditelluromethanes with trimethylplatinum iodide. In particular, we describe the first examples of a dimethyl ditelluride complex and present the results of a single crystal X-ray diffraction study of a ditelluride complex with trimethylplatinum iodide.

2. Experimental section

All reactions were carried out with Schlenk glassware under argon. Solvents were appropriately dried, freshly distilled, and finally deoxygenated by bubbling

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of a stream of argon for at least 15 min before use. Dimethyl ditelluride [10], bis(*p*-methoxyphenyl)ditelluride [11], bis(*p*-ethoxyphenyl)ditelluride [11], bis(*p*-methoxyphenyltelluro)methane [12], bis(phenyltelluromethane) [12], and trimethylplatinum iodide [13] were prepared by reported procedures.

Melting points were determined on a Ketan melting point apparatus. Elemental analysis was carried out with a Carlo Erba Elemental analyser model 1106. ¹H NMR spectra were recorded on Varian VXR 300S and Bruker 500 spectrometers and shifts are in δ values relative to a TMS internal standard.

2.1. Preparation of [(PtIMe₃)₂(CH₃Te)₂] (1)

Tetrameric trimethylplatinum(IV) iodide [(PtIMe₃)₄] (0.309 g, 0.204 mmol) was dissolved in chloroform (5 ml) with gentle warming. Neat dimethyl ditelluride (0.117 g, 0.409 mmol) was added, and dissolved rapidly as the solution turned dark red. After 2 h stirring at room temperature, hexane (25 ml) was added and the mixture kept at -20°C overnight to give dark red crystals. Recrystallization from CH₂Cl₂/hexane mixture (1:1) afforded red crystals of [(PtIMe₃)₂(CH₃Te)₂]. Yield 45%; m.p. 99–100°C; C, 9.22 (9.43); H, 2.30 (2.37)%. Static NMR data (in CDCl₃ at -20°C), ¹H: 1.63, 6H, ²J(Pt-H) 70 Hz, Pt-Me *trans* Te; 1.10, 6H, ²J(Pt-H) 73 Hz, Pt-Me *trans* I; 1.18, 6H, ²J(Pt-H) 72.6 Hz, Pt-Me *trans* I; 2.92, 6H, {(CH₃)₂Te₂}. ¹H NMR data for {(CH₃)₂Te₂} (in CDCl₃): 2.18.

The related bis(*p*-methoxyphenyl)ditelluride, bis(*p*-ethoxyphenyl)ditelluride and bis(*p*-methoxyphenyltelluro)methane complexes were similarly prepared, and characterization data are given below.

[(PtIMe₃)₂{(*p*-MeOC₆H₄)₂Te₂}] (2): obtained as dark red solid. Yield: 52%; m.p. 160–161°C; C, 20.1 (19.95); H, 2.7 (2.68)%. Static NMR data (in CDCl₃ at -20°C), ¹H: 2.15, 6H, ²J(Pt-H) 71.5 Hz, Pt-Me *trans* Te; 1.17, 6H, ²J(Pt-H) 74.1 Hz, Pt-Me *trans* I; 1.37, 6H, ²J(Pt-H) 75 Hz, Pt-Me *trans* I; 7.9, 4H, 6.9, 4H (aryl protons); 3.9, 6H (s, OMe).

¹H NMR data for (*p*-MeOC₆H₄)₂Te₂ in CDCl₃: 7.56, 4H; 6.62, 4H (aryl protons); 3.70, 6H (s, OMe).

[(PtIMe₃)₂{(*p*-EtOC₆H₄)₂Te₂}] (3): obtained as yellowish-orange solid. Yield: 60%; m.p. 92–93°C; C, 21.37 (21.44); H, 2.89 (2.94)%. Static NMR data (in CDCl₃ at -20°C), ¹H, 2.18, 6H, ²J(Pt-H) 71.7 Hz, Pt-Me *trans* Te; 1.17, 6H, ²J(Pt-H) 75.3 Hz, Pt-Me *trans* I; 1.37, 6H, ²J(Pt-H) 74.7 Hz, Pt-Me *trans* I; 7.9, 4H, 6.9, 4H (aryl protons), 4.03, 4H, O-CH₂; 1.43, 6H, CH₃.

¹H NMR data for *p*-(EtOC₆H₄)₂Te₂: 7.7, 4H, 6.6, 4H (aryl protons) 4.02, 4H, OCH₂ and 1.3, 6H, CH₃.

[(PtIMe₃)₂{(*p*-MeOC₆H₄Te)₂CH₂}] (4): yellow solid. Yield: 59%; m.p. 165–166°C; C, 20.8 (20.7); H, 2.88 (2.81)%.

Static NMR data (in CDCl₃ at -20°C): ¹H; 2.18, 6H, ²J(Pt-H) 69 Hz, Pt-Me *trans* Te; 1.25, 6H, ²J(Pt-H) 73.5 Hz, Pt-Me *trans* I; 1.72, 6H, ²J(Pt-H) 72 Hz, Pt-Me *trans* I; 7.78, 4H, 6.8, 4H (aryl protons), 3.84, 2H (CH₂), 3.73, 6H (OMe).

¹H NMR data for {(*p*-MeOC₆H₄Te)₂CH₂}: 7.7, 4H; 6.7, 4H (aryl protons), 3.82, 2H (s, CH₂); 3.73, 6H (s, OMe).

2.2. Preparation of [(PtIMe₃)₂{(PhTe)₂CH₂}] (5)

To a solution of trimethylplatinum iodide (0.02 g, 0.013 mmol) in chloroform (5 ml) was added a large excess of bis(phenyltelluro)methane (0.04 g, 0.104 mmol). The mixture was stirred for 6 h, the solvent then removed, and the residue recrystallized from hexane-chloroform (1:1) to give the product as a yellow solid. Yield: 49%, m.p. 73–75°C; C, 28.35 (28.69); H, 2.7 (2.74)%.

Static NMR data (in CDCl₃ at -20°C): ¹H, 2.26, 6H, ²J(Pt-H) 69 Hz, Pt-Me *trans* Te; 1.56, 3H, ²J(Pt-H) 71.4 Hz, Pt-Me *trans* I; 7.8, 4H, 7.6, 6H, 7.2, 10 H (aryl protons), 3.8, 4H (s, CH₂ groups).

2.3. Preparation of [(PtIMe₃)₂(PhTe)₂CH₂] (6)

A mixture of tetrameric trimethylplatinum(IV) iodide (0.02 g, 0.013 mmol) and a slight excess of bis(phenyltelluro)methane (0.01 g, 0.023 mmol) in chloroform (5 ml) was stirred for 2 h then kept at -20°C overnight during which a solid separated. Recrystallization from chloroform-hexane (1:1) gave the desired product as pale yellow crystals. Yield: 58%; m.p. 98–100°C; C, 24.79 (24.27); H, 2.7 (2.80)%.

Static NMR data: ¹H; 2.21, 6H, ²J(Pt-H) 70.5 Hz, Pt-Me *trans* Te; 1.58, 3H, ²J(Pt-H) 72 Hz, Pt-Me *trans* I; 7.8–7.3, 10 H (aryl protons), 3.9, 2H (CH₂).

¹H NMR data of (PhTe)₂CH₂: 7.7–7.2, 10 H (m, aryl protons), 3.8, 2H, (CH₂).

2.4. X-ray data and structure solution

A red prismatic crystal of compound 2 was mounted on a glass fibre. All measurements were made on a Rigaku AFC6S diffractometer with graphite monochromated Mo Kα radiation and a 12 kW rotating anode generator. The relevant experimental data are summarized in Table 1.

Of the 8828 reflections collected, 8505 were unique (*R*_{int} = 0.203). The intensity of three representative reflections measured after every 150 reflections remained constant throughout data collection. An empirical absorption correction, using the program DIFABS [14], was applied, resulting in transmission factors ranging from 0.95 to 1.02.

The structure was solved by direct methods [15]. The non-hydrogen atoms were refined anisotropically.

TABLE 1. Experimental details

A. Crystal Data	
Empirical formula	C ₂₀ H ₃₂ I ₂ O ₂ Pt ₂ Te ₂
Formula weight	1203.66
Crystal color, Habit	red, prism
Crystal dimensions (mm)	0.250 × 0.200 × 0.300
Crystal system	monoclinic
No. reflections used for unit cell determination (2θ range)	25 (30.6–35.2°)
Lattice parameters:	<i>a</i> = 13.521(3) Å <i>b</i> = 14.987(7) Å <i>c</i> = 14.173(2) Å β = 100.42(1)° V = 2825(2) Å ³
Space group	<i>P</i> 2 ₁ / <i>n</i> (non-standard No. 14)
Z value	4
<i>D</i> _{calc}	2.83 g/cm ³
<i>F</i> ₀₀₀	2136
μ(MoKα)	142.1 cm ⁻¹
B. Intensity measurements	
Diffractionmeter	Rigaku AFC6S
Radiation	MoKα (λ = 0.71069 Å)
Temperature	23°C
Crystal to detector distance	40 cm
Scan type	ω
Scan rate	8.0°/min (in ω) (2 rescans)
Scan width	(0.91 + 0.30 tanθ)°
2θ _{max}	60.0°
No. of reflections measured	Total: 8828 Unique: 8505 (<i>R</i> _{int} = 0.203)
Corrections	Lorentz-polarization Absorption (trans. factors: 0.95–1.02) Secondary extinction (coefficient: 0.10408E-06)
C. Structure solution and refinement	
Structure solution	Direct methods
Refinement	Full-matrix least-squares
Function minimized	Σw(<i>F</i> _o - <i>F</i> _c) ²
Least-squares weights	4 <i>F</i> _o ² /σ ² (<i>F</i> _o ²)
<i>p</i> -factor	0.03
Anomalous dispersion	All non-hydrogen atoms
No. observations (<i>I</i> > 3.00σ(<i>I</i>))	2876
No. variables	254
Reflection/parameter ratio	11.32
Residuals: <i>R</i> ; <i>R</i> _w	0.048; 0.051
Goodness of fit indicator	1.30
Max shift/error in final cycle	0.95
Maximum peak in final diff. map	1.30 e ⁻ /Å ³
Minimum peak in final diff. map	-1.25 e ⁻ /Å ³

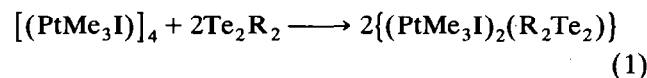
The final cycle of full-matrix least square refinement was based on 2876 observed reflections (*I* > 3σ(*I*)) and 254 variable parameters and converged (largest parameter shift was 0.95 times its esd) with unweighted and weighted agreement factors of: *R* = [Σ|*F*_o| - |*F*_c|| / Σ*F*_o] = 0.048; *R*_w = [(Σw(|*F*_o| - |*F*_c||)² / Σw*F*_o²)]^{1/2} =

0.051. Neutral atom scattering factors were taken from Cromer and Waber [16]. Anomalous dispersion effects were included in *F*_{calc} [17], the values for *f*' and *f*" were those of Cromer [18]. The final atomic coordinates are listed in Table 2. Tables of thermal parameters and of hydrogen atom coordinates have been deposited with the Cambridge Crystallographic Data Centre.

All calculations were made by use of the TEXAN crystallographic software package of Molecular Structure Corporation [19], PLUTO [20], and ORTEP [21].

3. Results and Discussion

Diorganoylditellurides, R₂Te₂, (R = Me, *p*-MeO-C₆H₄, *p*-EtOC₆H₄) reacted readily in chloroform solution with tetrameric trimethylplatinum(IV) iodide to give binuclear complexes 1–3 (eqn. (1)).



- 1: R = Me
- 2: R = *p*-MeOC₆H₄
- 3: R = *p*-EtOC₆H₄

TABLE 2. Positional parameters and *B*_{eq} for non-hydrogen atoms

Atom	<i>x</i>	<i>y</i>	<i>z</i>	<i>B</i> _{eq}
Pt(1)	0.26622(5)	0.21312(6)	0.12416(5)	3.10(3)
Pt(2)	0.55415(6)	0.26481(6)	0.11471(6)	3.28(3)
I(1)	0.3828(1)	0.2163(1)	-0.01963(9)	3.87(6)
I(2)	0.4484(1)	0.2067(1)	0.25548(9)	3.59(5)
Te(1)	0.28065(9)	0.3919(1)	0.15499(8)	3.05(5)
Te(2)	0.4632(1)	0.4264(1)	0.10306(9)	3.12(5)
O(1)	0.018(1)	0.613(1)	-0.172(1)	5.1(7)
O(2)	0.635(1)	0.680(1)	0.442(1)	4.1(6)
C(11)	0.180(1)	0.206(2)	0.228(2)	6(1)
C(12)	0.136(1)	0.218(2)	0.026(2)	6(1)
C(13)	0.255(1)	0.078(1)	0.113(1)	3.7(8)
C(21)	0.680(1)	0.299(2)	0.214(2)	5(1)
C(22)	0.632(1)	0.304(2)	0.012(1)	5(1)
C(23)	0.621(2)	0.147(2)	0.112(2)	6(1)
C(111)	0.198(1)	0.465(1)	0.040(1)	3.2(8)
C(112)	0.143(1)	0.543(1)	0.061(1)	3.1(8)
C(113)	0.086(1)	0.586(2)	-0.013(1)	4(1)
C(114)	0.086(1)	0.563(1)	-0.107(1)	4.1(9)
C(115)	0.133(2)	0.488(2)	-0.128(2)	6(1)
C(116)	0.192(2)	0.444(1)	-0.058(1)	4(1)
C(117)	0.013(2)	0.589(2)	-0.270(2)	6(1)
C(211)	0.526(1)	0.508(1)	0.221(1)	2.3(7)
C(212)	0.553(1)	0.594(1)	0.205(1)	3.8(9)
C(213)	0.586(2)	0.650(1)	0.277(2)	4(1)
C(214)	0.599(1)	0.619(1)	0.373(1)	4(1)
C(215)	0.573(2)	0.535(2)	0.391(1)	5(1)
C(216)	0.542(2)	0.480(1)	0.315(1)	5(1)
C(217)	0.653(2)	0.650(2)	0.539(2)	6(1)

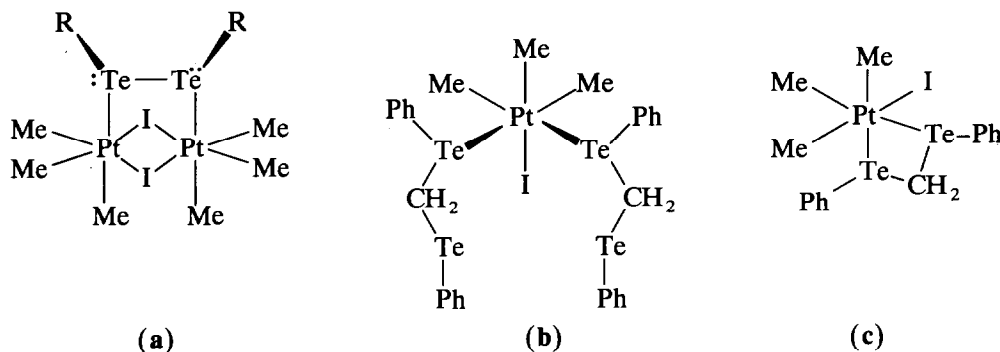
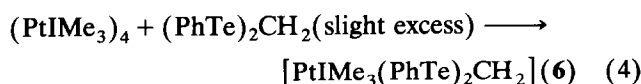
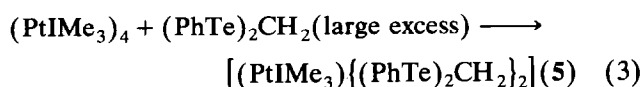
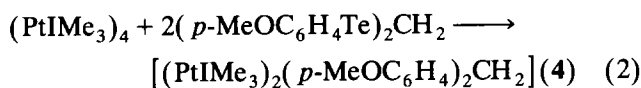


Fig. 1. Diagrammatic representation of the complexes.

The reaction of the telluroether ligands, RTeCH₂TeR, (R = C₆H₅, *p*-MeOC₆H₄) with trimethylplatinum (IV) iodide gave different types of isolated complexes depending upon reactant ratios and reaction times. The bidentate ligand, bis(methoxyphenyltelluro)methane, reacted with trimethylplatinum iodide in 1:2 molar ratio to give the dinuclear type complex *fac*-[(PtIMe₃)₂(*p*-MeOC₆H₄)₂CH₂] (4) (eqn. (2)). Bis(phenyltelluro)methane gave two different mononuclear type of complexes; one in which both ligands interact with the metal centre in monodentate fashion (eqn. (3)) and another in which it is coordinated in a bidentate mode to form a four membered ring (eqn. (4)).



These complexes are yellow-red crystalline solids, readily soluble in common organic solvents and stable both in air and in solution. They have been characterized by elemental analyses, ¹H NMR, dynamic NMR studies, and in one case a single crystal diffraction study.

3.1. Static NMR studies

For all the complexes NMR spectra were recorded in CDCl₃ at -20°C. The spectra of complexes 1-4 were quite similar to those of [(PtIMe₃)₂R₂E₂] (R = Me, E = S, Se; R = Ph, E = Te) [8,22,23], suggesting that the new ditelluride complexes do have a dinuclear structure in solution (Fig. 1a). This *trans* (DL) configuration is also adopted in the solid state structure of complex 2 (*vide infra*). The four observed signals in

their spectra at -20°C are assigned as follows. The signal at lowest applied field is attributed to the TeR groups (R = Me, *p*-MeOC₆H₄, *p*-EtOC₆H₄, the signal at an intermediate field position to the platinum methyls *trans* to Te (*i.e.* axial), and the two resonances at highest field to the platinum methyls *trans* to iodine (*i.e.* equatorial), the more highly shielded equatorial Pt-Me groups being those directly above the Te-R groups [8].

The ¹H NMR data for the mononuclear complex *fac*-[(PtIMe₃)(PhTe)₂CH₂]₂ (5) indicate that the ligand is coordinated to the metal atom in a monodentate fashion, with a *fac*-orientation about the platinum(IV) centre (Fig. 1b). Two signals due to Pt-Me protons are observed, at δ 1.58 and 2.21, in the ratio 1:2, both showing coupling with ¹⁹⁵Pt. The signal at highest field is assigned to Pt-Me *trans* to iodine, and that at lower field to the two Pt-Me *trans* to tellurium. The two resonances at lower field (in the aryl region) are as-

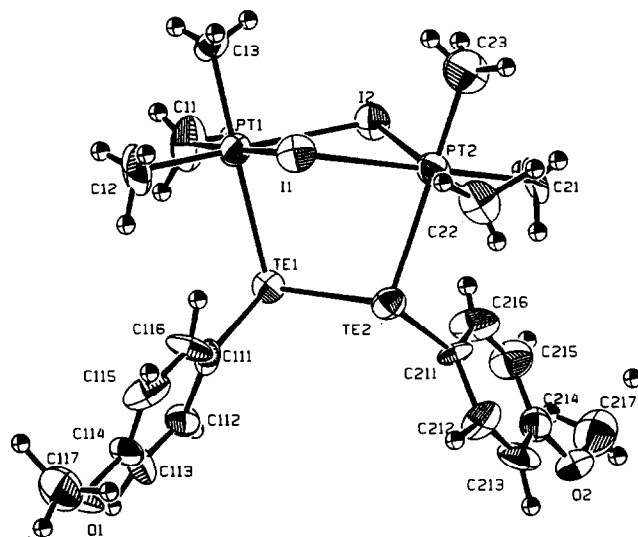


Fig. 2. Molecular structure of complex 2.

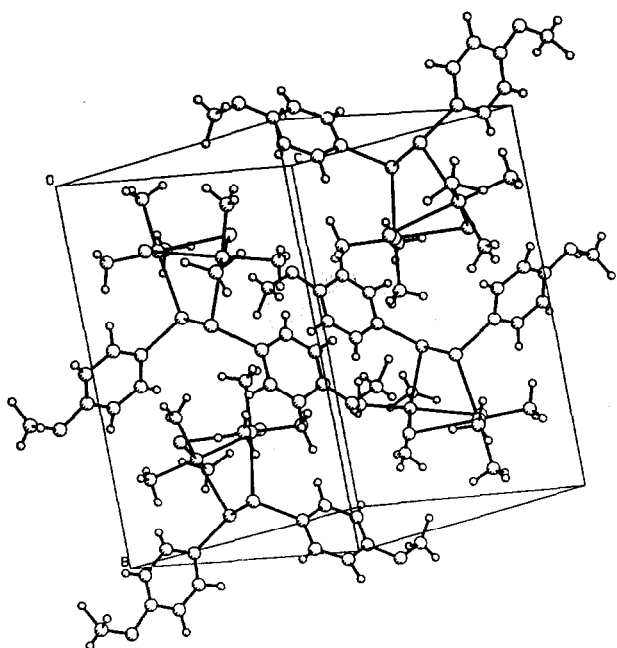


Fig. 3. Packing diagram.

signed to the Ph attached to the coordinated tellurium of the ligand, and the multiplet to the Ph attached by uncoordinated Te. The signal from the Ph of the coordinated Te is ~ 0.1 ppm downfield from that for the free ligand.

In the case of **6** the integrals of the signals from Pt–Me and Te–CH₂ clearly indicate it to be a 1:1 complex (Fig. 1c).

3.2. Dynamic NMR studies

The binuclear complexes **1–4** were studied by variable temperature NMR studies in the temperature range -50° to $+40^\circ\text{C}$. Complexes **2** and **3** were found to be fluxional like the corresponding complexes of diphenylditelluride [8]. On warming **2** from -50°C the equatorial Pt–Me resonances steadily broaden, and finally sharpen at *ca.* 27°C to a single peak with ¹⁹⁵Pt satellite signals. This behaviour is the result of the well known inversion at the Te atoms. The inversion, when sufficiently rapid, causes chemical shift equivalence of the equatorial methyl groups. Further increase in temperature causes broadening of the axial Pt–Me signal. These changes in the spectral pattern were found to be fully reversible.

Interestingly the variable temperature studies of complexes **1** and **4** revealed little evidence of any fluxionality up to 45°C . This is presumably due to the higher tellurium inversion barrier in the dimethyl ditelluride and the ditelluroether complexes compared with those for diaryl ditellurides, for which the inversion barrier is especially low [9].

3.3. Structure

The crystal and molecular structure of one of the complexes, namely [(PtMe₃)₂(p-MeOC₆H₄Te)₂] (**2**), was determined by X-ray diffraction. Bond lengths and bond angles are given in Table 3. The molecular struc-

TABLE 3. Intramolecular distances (Å) and angles (°). Estimated standard deviations in the least significant figure are given in parentheses.

Distances			
Pt1–I1	2.794(2)	O1–C117	1.42(3)
Pt1–I2	2.807(2)	O2–C214	1.37(2)
Pt1–Te1	2.716(2)	O2–C217	1.43(3)
Pt1–C11	2.04(2)	C111–C112	1.44(3)
Pt1–C12	2.03(2)	C111–C116	1.41(3)
Pt1–C13	2.03(2)	C112–C113	1.36(3)
Pt2–I1	2.815(2)	C113–C114	1.37(3)
Pt2–I2	2.796(2)	C114–C115	1.34(3)
Pt2–Te2	2.708(2)	C115–C116	1.34(3)
Pt2–C21	2.07(2)	C211–C212	1.38(3)
Pt2–C22	2.04(2)	C211–C216	1.37(2)
Pt2–C23	2.00(3)	C212–C213	1.34(3)
Te1–Te2	2.749(2)	C213–C214	1.42(3)
Te1–C111	2.11(2)	C214–C215	1.34(3)
Te2–C211	2.12(2)	C215–C216	1.36(3)
O1–C114	1.40(2)		
Angles			
I1–Pt1–I2	86.61(4)	Te2–Pt2–C23	175.2(7)
I1–Pt1–Te1	93.83(5)	C21–Pt2–C22	86.7(9)
I1–Pt1–C11	177.8(8)	C21–Pt2–C23	85(1)
I1–Pt1–C12	92.0(6)	C22–Pt2–C23	86.8(9)
I1–Pt1–C13	90.2(6)	Pt1–I1–Pt2	90.86(4)
I2–Pt1–Te1	84.16(5)	Pt1–I2–Pt2	90.97(4)
I2–Pt1–C11	94.0(6)	Pt1–Te1–Te2	100.65(5)
I2–Pt1–C12	178.6(6)	Pt1–Te1–C111	112.0(5)
I2–Pt1–C13	93.5(5)	Te2–Te1–C111	94.3(5)
Te1–Pt1–C11	88.4(8)	Pt2–Te2–Te1	103.58(6)
Te1–Pt1–C12	95.9(8)	Pt2–Te2–C211	110.6(5)
Te1–Pt1–C13	175.2(5)	Te1–Te2–C211	98.5(4)
C11–Pt1–C12	87.4(9)	C114–O1–C117	115(2)
C11–Pt1–C13	88(1)	C214–O2–C217	117(2)
C12–Pt1–C13	86.5(9)	Te1–C111–C112	119(1)
I1–Pt2–I2	86.42(4)	Te1–C111–C116	125(1)
I1–Pt2–Te2	83.15(5)	C112–C111–C116	117(2)
I1–Pt2–C21	179.5(7)	C111–C112–C113	118(2)
I1–Pt2–C22	93.5(6)	C112–C113–C114	122(2)
I1–Pt2–C23	94.5(7)	O1–C114–C113	113(2)
I2–Pt2–Te2	92.12(5)	O1–C114–C115	125(2)
I2–Pt2–C21	93.4(7)	C113–C114–C115	121(2)
I2–Pt2–C22	178.7(7)	C114–C115–C116	119(2)
I2–Pt2–C23	91.8(6)	C111–C116–C115	123(2)
Te2–Pt2–C21	97.3(7)	Te2–C211–C212	119(1)
Te2–Pt2–C22	89.2(6)	Te2–C211–C216	124(1)
C212–C211–C216	116(2)		
C211–C212–C213	122(2)		
C212–C213–C214	119(2)		
O2–C214–C213	115(2)		
O2–C214–C215	125(2)		
C213–C214–C215	120(2)		
C214–C215–C216	118(2)		
C211–C216–C215	124(2)		

ture of the bis(*p*-methoxyphenyl)ditelluride complex consists of two pseudo-octahedral platinum(IV) centres held together by three bridging groups, two of these being the conventional iodide bridges and the third a rare ditelluride bridge (Fig. 2). As such, this is the first ditelluride-bridged platinum complex, and only the second ditelluride-bridged complex characterized by X-ray diffraction.

The structure of the complex is essentially the same as that for the dimethyl disulphide and diselenide analogues [24,25] and the first ditelluride bridged molecule, namely [Re₂Br₂(CO)₆(Te₂Ph₂)] [7]. The important change from selenium to tellurium is the lengthening of the platinum...platinum non-bonded distance from 3.901(2) Å in the diselenide to 3.995(1) Å in the ditelluride complex. This is due to the fact that the Te-Te bond (2.744 Å) is longer than the Se-Se bond (2.358 Å). As a consequence of the longer bond length of the bridging ditelluride, the dihedral angle (folding angle) between the planes defined by Pt(1), I(1), I(2) and Pt(2), I(1) and I(2) is 23.7°, compared to the 30.9° for the Me₂Se₂ complex. This can be attributed to the decrease in strain in the Pt₂Te₂ fragment due to the longer dichalcogenide bond.

The Pt-Te distances in the complex (2.716(2) and 2.708(2) Å) are larger than the sum of the covalent radii of the two elements (2.63 Å [26], and those reported for other complexes containing Pt-Te bonds [4a,27]. As expected, the Te-Te bond length (2.749(2) Å) in the complex is significantly longer than the Te-Te bond length in the free ditelluride, Te₂(C₆H₄-OMe-*p*)₂ [2.715(2), 2.705(3) Å] [28]. This can be attributed to the reduction of the "double bond" character [29] as a result of donation of the *p* lone pair to Pt. However, the value of 2.749(2) Å is close to the sum of the covalent radii of 2.74 Å. An interesting consequence of the coordination of the Te-Te bridge is the reduction of the C-Te-Te-C dihedral angle from 86.8(5) and 81.2(5)° in the free ligand to 67.2° in the complex.

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