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Table S1: Final atomic coordinates and isotropic or equivalent temperature factors ($Å^2$ x 100) for **2**, with Esd's in parentheses.

Atom	x/a	y/b	z/c	Ueq/Uiso
Ru(1)	0.20454(3)	0.54511(2)	0.25160(2)	3.27(5)
Ru(2)	0.37083(3)	0.62723(2)	0.21142(2)	3.79(6)
Ru(3)	0.20090(3)	0.69014(2)	0.26915(2)	3.36(6)
P(1)	0.0727(1)	0.51921(6)	0.32503(6)	3.6(2)
P(2)	0.1179(1)	0.67415(6)	0.36383(6)	3.8(2)
C(1)	0.3539(4)	0.5152(3)	0.3078(3)	4.8(9)
O(1)	0.4392(4)	0.4961(2)	0.3433(2)	7.3(8)
C(2)	0.1850(5)	0.4607(3)	0.2040(3)	4.9(9)
O(2)	0.1798(4)	0.4106(2)	0.1735(2)	8.2(9)
C(3)	0.5286(5)	0.6285(3)	0.2683(3)	5.(1)
O(3)	0.6188(4)	0.6308(3)	0.3052(2)	8.2(9)
C(4)	0.4211(5)	0.5562(3)	0.1582(3)	7.(1)
O(4)	0.4480(5)	0.5142(3)	0.1260(3)	12.(1)
C(5)	0.4105(5)	0.7048(3)	0.1622(3)	6.(1)
O(5)	0.4338(4)	0.7499(3)	0.1311(3)	10.(1)
C(6)	0.3527(5)	0.7299(3)	0.3131(3)	5.2(9)
O(6)	0.4412(4)	0.7558(2)	0.3416(2)	7.7(9)
C(7)	0.1275(5)	0.7784(3)	0.2470(3)	5.1(9)
O(7)	0.0861(4)	0.8315(2)	0.2328(2)	7.8(9)
C(8)	0.0107(4)	0.5994(3)	0.3549(3)	4.0(8)
C(9)	0.0748(4)	0.6225(2)	0.2125(2)	3.5(7)
C(10)	0.1690(4)	0.6262(2)	0.1739(2)	3.4(7)
C(11)	-0.0602(4)	0.6234(3)	0.1843(2)	3.9(7)
C(12)	-0.1329(5)	0.6798(3)	0.1922(3)	5.4(9)
C(13)	-0.2560(5)	0.6825(3)	0.1606(3)	7.(1)
C(14)	-0.3087(5)	0.6277(4)	0.1217(3)	7.(1)
C(15)	-0.2390(5)	0.5698(4)	0.1159(3)	7.(1)
C(16)	-0.1147(5)	0.5663(3)	0.1476(3)	5.2(9)
C(21)	0.1319(4)	0.6310(2)	0.0997(2)	3.9(7)
C(22)	0.0785(5)	0.6917(3)	0.0713(3)	5.2(9)
C(23)	0.0361(6)	0.6951(3)	0.0025(3)	7.(1)
C(24)	0.0448(6)	0.6374(4)	-0.0373(3)	7.(1)
C(25)	0.0972(6)	0.5782(3)	-0.0091(3)	6.(1)
C(26)	0.1428(5)	0.5741(3)	0.0592(2)	5.1(9)
C(31)	0.1422(4)	0.4703(2)	0.3998(2)	4.1(8)
C(32)	0.2061(5)	0.4105(3)	0.3909(3)	6.(1)
C(33)	0.2603(6)	0.3698(3)	0.4457(4)	7.(1)
C(34)	0.2556(6)	0.3929(4)	0.5096(3)	7.(1)
C(35)	0.1969(6)	0.4529(4)	0.5193(3)	7.(1)
C(36)	0.1372(5)	0.4912(3)	0.4644(3)	6.(1)
C(41)	-0.0673(4)	0.4684(3)	0.2937(2)	4.2(8)
C(42)	-0.1869(5)	0.4921(3)	0.2945(3)	5.2(9)
C(43)	-0.2887(5)	0.4505(4)	0.2688(3)	7.(1)

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Table S1 (continued)

Atom	x/a	y/b	z/c	Ueq/Uiso
C(44)	-0.2738(6)	0.3875(4)	0.2424(3)	7.(1)
C(45)	-0.1557(6)	0.3621(4)	0.2419(4)	8.(1)
C(46)	-0.0540(5)	0.4029(3)	0.2677(3)	7.(1)
C(51)	0.2213(5)	0.6566(2)	0.4439(2)	4.5(8)
C(52)	0.3358(5)	0.6255(3)	0.4439(3)	6.(1)
C(53)	0.4064(6)	0.6061(4)	0.5067(4)	7.(1)
C(54)	0.3678(8)	0.6196(4)	0.5649(4)	9.(2)
C(55)	0.2548(9)	0.6488(4)	0.5637(3)	10.(2)
C(56)	0.1812(7)	0.6670(3)	0.5038(3)	8.(1)
C(61)	0.0229(5)	0.7440(3)	0.3887(2)	5.1(9)
C(62)	-0.1019(6)	0.7374(3)	0.3917(3)	7.(1)
C(63)	-0.1645(8)	0.7903(4)	0.4165(5)	11.(2)
C(64)	-0.102(1)	0.8511(5)	0.4381(4)	11.(2)
C(65)	0.0205(9)	0.8596(3)	0.4343(4)	9.(2)
C(66)	0.0841(6)	0.8063(3)	0.4088(3)	7.(1)

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Table S2: Final anisotropic thermal parameters (U_{ij} x 100) for **2**, with Esd's in parentheses.

Atom	U11	U22	U33	U12	U13	U23
Ru(1)	3.10(2)	3.05(2)	3.68(2)	0.25(1)	0.43(1)	-0.02(2)
Ru(2)	2.76(2)	4.18(2)	4.45(2)	-0.07(2)	0.56(2)	-0.35(2)
Ru(3)	3.29(2)	3.08(2)	3.71(2)	0.02(1)	0.53(1)	-0.18(2)
P(1)	3.21(6)	3.50(6)	4.04(6)	0.07(5)	0.54(5)	0.34(5)
P(2)	3.87(6)	3.68(6)	3.73(6)	0.64(5)	0.53(5)	-0.14(5)
C(1)	3.9(3)	4.3(3)	6.0(3)	0.7(2)	0.6(2)	0.9(2)
O(1)	4.8(2)	8.4(3)	8.8(3)	1.5(2)	-0.6(2)	2.9(3)
C(2)	5.9(3)	3.8(3)	5.1(3)	0.1(2)	0.3(2)	-0.6(2)
O(2)	11.0(4)	5.2(3)	8.3(3)	-0.3(3)	1.0(3)	-2.4(2)
C(3)	3.9(3)	5.7(3)	6.8(4)	0.2(3)	0.1(3)	0.1(3)
O(3)	4.5(2)	11.4(4)	8.6(3)	0.2(2)	-1.6(2)	-0.6(3)
C(4)	4.3(3)	6.4(4)	9.1(5)	-0.3(3)	1.7(3)	-2.8(3)
O(4)	8.3(4)	10.9(4)	16.9(6)	0.2(3)	4.2(4)	-7.6(4)
C(5)	3.8(3)	6.1(4)	7.8(4)	0.4(2)	1.5(3)	0.9(3)
O(5)	8.0(3)	8.0(3)	14.8(5)	0.6(3)	3.3(3)	5.2(3)
C(6)	4.8(3)	5.6(3)	5.2(3)	-0.6(3)	0.6(2)	-1.2(3)
O(6)	5.6(2)	9.5(3)	8.1(3)	-2.5(2)	0.1(2)	-3.6(3)
C(7)	6.0(3)	4.0(3)	5.4(3)	0.0(3)	1.3(3)	0.2(2)
O(7)	8.9(3)	4.5(2)	10.1(3)	1.6(2)	0.6(3)	1.6(2)
C(8)	3.6(2)	4.3(2)	3.9(3)	0.6(2)	0.8(2)	0.3(2)
C(9)	3.2(2)	3.7(2)	3.7(2)	-0.1(2)	0.4(2)	-0.4(2)
C(10)	3.5(2)	3.8(2)	2.9(2)	-0.2(2)	0.0(2)	0.0(2)
C(11)	3.1(2)	5.5(3)	3.2(2)	0.4(2)	0.4(2)	0.5(2)
C(12)	4.0(3)	4.6(3)	7.6(4)	0.9(2)	1.0(3)	0.4(3)
C(13)	3.8(3)	7.8(4)	9.1(5)	1.7(3)	1.5(3)	1.7(4)
C(14)	3.3(3)	11.2(6)	6.6(4)	0.3(3)	0.0(3)	1.1(4)
C(15)	4.3(3)	9.8(5)	6.8(4)	-0.8(3)	0.0(3)	-2.2(4)
C(16)	3.9(3)	7.1(4)	4.8(3)	-0.1(3)	0.3(2)	-1.5(3)
C(21)	3.1(2)	4.8(3)	3.7(2)	-0.9(2)	0.8(2)	0.2(2)
C(22)	6.0(3)	5.3(3)	4.3(3)	-0.2(3)	0.1(2)	1.2(2)
C(23)	7.9(4)	7.1(4)	5.2(3)	-0.1(3)	-0.6(3)	2.1(3)
C(24)	8.1(4)	8.8(5)	3.7(3)	-2.2(4)	0.1(3)	0.8(3)
C(25)	7.9(4)	6.6(4)	4.9(3)	-1.3(3)	1.2(3)	-1.2(3)
C(26)	5.9(3)	5.5(3)	3.9(3)	-0.3(3)	0.6(2)	-0.6(2)
C(31)	3.5(2)	3.8(3)	4.9(3)	-0.1(2)	0.4(2)	1.2(2)
C(32)	5.4(3)	5.1(3)	6.3(4)	0.7(3)	0.0(3)	0.7(3)
C(33)	6.3(4)	5.5(4)	9.3(5)	1.3(3)	0.3(3)	2.2(3)
C(34)	6.5(4)	8.3(5)	6.9(4)	0.2(4)	0.1(3)	3.8(4)
C(35)	7.1(4)	8.4(5)	4.8(3)	-0.7(3)	1.0(3)	2.2(3)
C(36)	6.3(3)	6.1(3)	4.8(3)	-0.1(3)	1.4(3)	1.6(3)
C(41)	3.7(2)	4.9(3)	4.1(3)	-0.6(2)	0.2(2)	0.4(2)
C(42)	4.1(3)	6.1(3)	5.2(3)	-0.1(2)	0.5(2)	-0.2(3)
C(43)	3.4(3)	9.5(5)	6.9(4)	-0.5(3)	0.8(3)	-0.2(4)
C(44)	5.3(4)	9.1(5)	6.9(4)	-2.6(3)	0.3(3)	-1.1(4)
C(45)	6.6(4)	6.8(4)	9.4(5)	-2.4(3)	1.0(4)	-2.2(4)
C(46)	5.1(3)	5.2(3)	9.2(5)	-1.1(3)	0.7(3)	-1.2(3)
C(51)	5.8(3)	3.3(3)	4.4(3)	0.3(2)	-0.5(2)	0.0(2)
C(52)	5.2(3)	5.3(3)	6.7(4)	-0.4(3)	-0.8(3)	0.9(3)
C(53)	5.6(4)	7.1(4)	9.6(5)	0.2(3)	-1.7(3)	1.8(4)

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Table S2 (continued)

Atom	U11	U22	U33	U12	U13	U23
C(54)	12.2(7)	8.0(5)	6.1(4)	0.6(5)	-2.9(4)	0.9(4)
C(55)	16.1(8)	8.5(5)	4.6(4)	4.8(5)	-0.4(4)	-1.1(4)
C(56)	11.9(6)	6.8(4)	3.8(3)	3.5(4)	0.9(3)	0.2(3)
C(61)	6.7(3)	4.5(3)	4.0(3)	2.0(3)	1.6(2)	0.5(2)
C(62)	7.3(4)	6.4(4)	8.8(5)	2.7(3)	4.0(4)	0.9(3)
C(63)	11.0(6)	8.1(5)	13.8(7)	5.1(5)	7.1(6)	2.4(5)
C(64)	15.9(9)	7.9(6)	10.0(6)	6.2(6)	5.9(6)	1.4(5)
C(65)	15.6(8)	4.4(4)	7.6(5)	2.2(4)	2.6(5)	-0.4(3)
C(66)	9.4(5)	5.1(4)	6.4(4)	1.9(3)	1.1(3)	-0.4(3)

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Table S3: Hydrogen positional and thermal parameters for **2**, with Esd's in parentheses.

Atom	x/a	y/b	z/c	Ueq/Uiso
H(1)	-0.041(5)	0.608(3)	0.322(3)	6.00(0)
H(2)	-0.018(5)	0.592(3)	0.390(3)	6.00(0)
H(12)	-0.09038(0)	0.72455(0)	0.22180(0)	6.00(0)
H(13)	-0.31100(0)	0.72920(0)	0.16600(0)	8.00(0)
H(14)	-0.40552(0)	0.62954(0)	0.09800(0)	8.00(0)
H(15)	-0.27934(0)	0.52517(0)	0.08586(0)	7.00(0)
H(16)	-0.05868(0)	0.52049(0)	0.14169(0)	6.00(0)
H(22)	0.07081(0)	0.73688(0)	0.10226(0)	6.00(0)
H(23)	-0.00667(0)	0.74328(0)	-0.01989(0)	8.00(0)
H(24)	0.01111(0)	0.64092(0)	-0.09131(0)	8.00(0)
H(25)	0.10637(0)	0.53217(0)	-0.04058(0)	8.00(0)
H(26)	0.18385(0)	0.52578(0)	0.08156(0)	6.00(0)
H(32)	0.20830(0)	0.39164(0)	0.34018(0)	7.00(0)
H(33)	0.30973(0)	0.32233(0)	0.43767(0)	8.00(0)
H(34)	0.30100(0)	0.36197(0)	0.55248(0)	8.00(0)
H(35)	0.19084(0)	0.47092(0)	0.56979(0)	7.50(0)
H(36)	0.08941(0)	0.54023(0)	0.47229(0)	6.50(0)
H(42)	-0.19939(0)	0.54345(0)	0.31512(0)	6.00(0)
H(43)	-0.38251(0)	0.47109(0)	0.26977(0)	7.00(0)
H(44)	-0.35393(0)	0.35472(0)	0.22283(0)	8.00(0)
H(45)	-0.14224(0)	0.31071(0)	0.22124(0)	8.00(0)
H(46)	0.04087(0)	0.38307(0)	0.26660(0)	7.00(0)
H(52)	0.36839(0)	0.61706(0)	0.39793(0)	7.00(0)
H(53)	0.49955(0)	0.58305(0)	0.50565(0)	8.50(0)
H(54)	0.42559(0)	0.60356(0)	0.61182(0)	10.00(0)
H(55)	0.22046(0)	0.65806(0)	0.61028(0)	10.00(0)
H(56)	0.08929(0)	0.69207(0)	0.50256(0)	8.00(0)
H(62)	-0.15074(0)	0.68932(0)	0.37443(0)	8.00(0)
H(63)	-0.26219(0)	0.78505(0)	0.41932(0)	10.00(0)
H(64)	-0.15135(0)	0.89396(0)	0.45808(0)	10.00(0)
H(65)	0.07094(0)	0.90715(0)	0.45195(0)	9.50(0)
H(66)	0.18239(0)	0.81142(0)	0.40707(0)	7.00(0)

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Table S4: Interatomic Distances (Å) for **2**, with Esd's in parentheses.

Note: the non crystallographic mirror plane symmetry of the molecule can be evaluated by comparison of the "equivalent" distances that are listed on the same line throughout the listing.

Ru-Ru					
Ru(1)-Ru(2)	2.6520(6)			Ru(2)-Ru(3)	2.6683(6)
		Ru(1)-Ru(3)	2.8120(7)		
Ru-P					
Ru(1)-P(1)	2.317(1)			Ru(3)-P(2)	2.298(1)
Ru-C (carbonyl groups)					
Ru(1)-C(1)	1.903(5)			Ru(3)-C(6)	1.897(5)
Ru(1)-C(2)	1.882(5)			Ru(3)-C(7)	1.895(5)
Ru(2)-C(4)	1.888(6)			Ru(2)-C(5)	1.891(6)
		Ru(2)-C(3)	1.893(5)		
Ru-C (bridging alkyne)					
Ru(1)-C(9)	2.108(4)			Ru(3)-C(9)	2.083(4)
Ru(1)-C(10)	2.202(4)			Ru(3)-C(10)	2.265(4)
		Ru(2)-C(10)	2.202(4)		
C-O (carbonyl groups)					
C(1)-O(1)	1.132(6)			C(6)-O(6)	1.147(6)
C(2)-O(2)	1.141(7)			C(7)-O(7)	1.134(7)
			C(3)-O(3)	1.126(6)	
C(4)-O(4)	1.113(9)			C(5)-O(5)	1.129(8)
C-C (multiple bond of the alkyne)					
		C(9)-C(10)	1.409(6)		

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Table S4: (continued)

C-C (carbon-phenyl bonds within the alkyne)			
C(9)-C(11)	1.484(6)	C(10)-C(21)	1.493(6)
C-C (within the phenyl substituents of the alkyne)			
C(11)-C(12)	1.374(7)	C(21)-C(22)	1.381(7)
C(12)-C(13)	1.383(7)	C(22)-C(23)	1.392(7)
C(13)-C(14)	1.378(9)	C(23)-C(24)	1.386(9)
C(14)-C(15)	1.367(9)	C(24)-C(25)	1.354(9)
C(15)-C(16)	1.396(7)	C(25)-C(26)	1.388(7)
C(16)-C(11)	1.397(7)	C(26)-C(21)	1.388(7)
P-C bonds within the bis(diphenylphosphino)methane ligand			
P(1)-C(8)	1.833(5)	P(2)-C(8)	1.844(5)
P(1)-C(31)	1.830(5)	P(2)-C(51)	1.835(5)
P(1)-C(41)	1.830(4)	P(2)-C(61)	1.828(6)
C-C bonds within the bis(diphenylphosphino)methane ligand			
C(31)-C(32)	1.376(7)	C(51)-C(52)	1.390(8)
C(32)-C(33)	1.400(8)	C(52)-C(53)	1.415(9)
C(33)-C(34)	1.38(1)	C(53)-C(54)	1.35(1)
C(34)-C(35)	1.35(1)	C(54)-C(55)	1.35(1)
C(35)-C(36)	1.394(8)	C(55)-C(56)	1.376(9)
C(36)-C(31)	1.385(7)	C(56)-C(51)	1.383(8)
C(41)-C(42)	1.390(7)	C(61)-C(62)	1.386(9)
C(42)-C(43)	1.393(7)	C(62)-C(63)	1.37(1)
C(43)-C(44)	1.35(1)	C(63)-C(64)	1.38(1)
C(44)-C(45)	1.385(9)	C(64)-C(65)	1.37(1)
C(45)-C(46)	1.384(8)	C(65)-C(66)	1.39(1)
C(46)-C(41)	1.385(8)	C(66)-C(61)	1.395(8)

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Table S5: Bond angles (deg.) for **2**, with Esd's in parentheses.

Ru-Ru-Ru			
Ru(2)-Ru(1)-Ru(3)	58.37(2)	Ru(2)-Ru(3)-Ru(1)	57.81(2)
Ru(1)-Ru(2)-Ru(3)	63.81(2)		
P-Ru-Ru			
P(1)-Ru(1)-Ru(3)	96.08(3)	P(2)-Ru(3)-Ru(1)	89.48(3)
P(1)-Ru(1)-Ru(2)	150.81(3)	P(2)-Ru(3)-Ru(2)	136.48(3)
C(alkyne)-Ru-Ru			
C(9)-Ru(1)-Ru(3)	47.5(1)	C(9)-Ru(3)-Ru(1)	48.2(1)
C(9)-Ru(1)-Ru(2)	85.3(1)	C(9)-Ru(3)-Ru(2)	85.3(1)
C(10)-Ru(1)-Ru(3)	52.0(1)	C(10)-Ru(3)-Ru(1)	50.01)
C(10)-Ru(1)-Ru(2)	53.0(1)	C(10)-Ru(3)-Ru(2)	52.2(1)
C(10)-Ru(2)-Ru(1)	53.0(1)	C(10)-Ru(2)-Ru(3)	54.4(1)
C(alkyne)-Ru-C(alkyne)			
C(9)-Ru(1)-C(10)	38.1(2)	C(9)-Ru(3)-C(10)	37.5(2)
C(alkyne)-C(alkyne)-Ru			
C(10)-C(9)-Ru(1)	74.6(2)	C(10)-C(9)-Ru(3)	78.3(2)
C(9)-C(10)-Ru(1)	67.3(2)	C(9)-C(10)-Ru(3)	64.2(2)
C(9)-C(10)-Ru(2)	126.9(3)		
C(11)-C(9)-Ru(1)	135.1(3)	C(11)-C(9)-Ru(3)	135.8(3)
C(21)-C(10)-Ru(1)	138.5(3)	C(21)-C(10)-Ru(3)	143.3(3)
C(21)-C(10)-Ru(2)	114.7(3)		
Ru-Ru-C(carbonyl)			
Ru(3)-Ru(1)-C(1)	104.7(2)	Ru(1)-Ru(3)-C(6)	115.3(2)
Ru(2)-Ru(1)-C(1)	78.5(2)	Ru(2)-Ru(3)-C(6)	76.5(2)
Ru(2)-Ru(1)-C(2)	111.9(2)	Ru(2)-Ru(3)-C(7)	127.0(2)
Ru(1)-Ru(2)-C(4)	92.1(2)	Ru(3)-Ru(2)-C(5)	97.1(2)
Ru(1)-Ru(2)-C(3)	114.9(2)	Ru(3)-Ru(2)-C(3)	111.0(2)

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Table S5 (continued)

C(carbonyl)-Ru-C(carbonyl)

C(1)-Ru(1)-C(2)	93.0(2)	C(6)-Ru(3)-C(7)	93.0(2)
C(3)-Ru(2)-C(4)	91.7(2)	C(3)-Ru(2)-C(5)	92.2(2)
C(4)-Ru(2)-C(5)	98.4(2)		

Ru-C-O

Ru(1)-C(1)-O(1)	176.5(5)	Ru(3)-C(6)-O(6)	176.6(5)
Ru(1)-C(2)-O(2)	175.6(5)	Ru(3)-C(7)-O(7)	178.1(5)
Ru(2)-C(4)-O(4)	178.4(5)	Ru(2)-C(5)-O(5)	177.9(5)
Ru(2)-C(3)-O(3)	175.6(5)		

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Table S6: Final atomic coordinates and isotropic or equivalent temperature factors ($Å^2$ x 100) for **6**, with Esd's in parentheses.

Atom	x/a	y/b	z/c	Ueq/Uiso
Ru(1)	0.20644(4)	0.51667(3)	0.21273(3)	2.54(3)
Ru(2)	0.21051(3)	0.48021(3)	0.37561(3)	2.33(3)
Ru(3)	0.19713(4)	0.37788(3)	0.26637(3)	2.30(3)
C(1)	0.1978(5)	0.5854(4)	0.1421(4)	3.5(4)
O(1)	0.1905(4)	0.6288(3)	0.0989(4)	6.0(4)
C(2)	0.2542(5)	0.5631(4)	0.3156(4)	3.1(4)
O(2)	0.2892(4)	0.6126(3)	0.3387(3)	4.5(3)
C(3)	0.3308(5)	0.4842(4)	0.4536(4)	3.4(4)
O(3)	0.3990(4)	0.4859(3)	0.5021(4)	5.8(4)
C(4)	0.1633(5)	0.5395(4)	0.4371(4)	3.3(4)
O(4)	0.1337(4)	0.5754(3)	0.4753(4)	6.5(4)
C(5)	0.1811(5)	0.2855(4)	0.2665(4)	3.7(4)
O(5)	0.1729(4)	0.2309(3)	0.2679(4)	6.4(4)
C(6)	0.1665(5)	0.3830(3)	0.1514(4)	3.2(4)
O(6)	0.1447(4)	0.3763(3)	0.0828(3)	4.7(3)
C(7)	0.0569(5)	0.3769(3)	0.3650(4)	3.2(4)
O(7)	-0.0077(4)	0.3513(3)	0.3844(3)	5.0(3)
C(9)	0.0928(4)	0.4608(3)	0.2806(4)	2.5(3)
C(10)	0.0501(4)	0.3988(3)	0.2813(4)	2.7(4)
C(20)	0.2247(5)	0.3734(3)	0.3905(4)	2.6(3)
C(30)	0.1508(5)	0.3879(3)	0.4238(4)	3.0(4)
P(1)	0.3510(1)	0.50146(8)	0.1970(1)	2.65(9)
C(8)	0.4183(5)	0.4459(3)	0.2735(4)	2.8(4)
P(2)	0.3588(1)	0.36859(8)	0.2791(1)	2.47(9)
C(11)	0.0504(4)	0.5101(3)	0.2180(4)	2.6(3)
C(12)	0.0087(5)	0.4961(4)	0.1357(4)	3.4(4)
C(13)	-0.0386(5)	0.5433(4)	0.0836(4)	3.8(4)
C(14)	-0.0462(5)	0.6063(4)	0.1099(4)	4.1(4)
C(15)	-0.0052(5)	0.6222(4)	0.1880(5)	4.5(5)
C(16)	0.0450(5)	0.5756(4)	0.2411(4)	3.3(4)
C(21)	-0.0404(5)	0.3808(3)	0.2215(4)	3.2(4)
C(22)	-0.0491(5)	0.3323(4)	0.1658(5)	4.0(4)
C(23)	-0.1349(6)	0.3183(5)	0.1122(5)	6.0(6)
C(24)	-0.2126(6)	0.3545(5)	0.1143(5)	6.4(6)
C(25)	-0.2066(6)	0.4022(5)	0.1707(6)	6.4(6)
C(26)	-0.1205(5)	0.4151(4)	0.2258(5)	4.9(5)
C(31)	0.1553(5)	0.3836(3)	0.5112(4)	3.2(4)
C(32)	0.0970(6)	0.4215(4)	0.5432(5)	4.8(5)
C(33)	0.1018(7)	0.4187(5)	0.6244(5)	6.7(6)
C(34)	0.1627(7)	0.3772(6)	0.6742(5)	7.6(7)
C(35)	0.2190(7)	0.3383(6)	0.6422(5)	7.7(7)
C(36)	0.2154(6)	0.3408(5)	0.5612(5)	5.7(5)

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Table S6 (Continued)

Atom	x/a	y/b	z/c	Ueq/Uiso
C(41)	0.4246(4)	0.5746(2)	0.2085(2)	3.1(2)
C(42)	0.4784(4)	0.5950(2)	0.2837(2)	4.4(2)
C(43)	0.5314(4)	0.6521(2)	0.2907(2)	5.9(2)
C(44)	0.5306(4)	0.6889(2)	0.2226(2)	6.4(3)
C(45)	0.4768(4)	0.6685(2)	0.1473(2)	5.5(2)
C(46)	0.4238(4)	0.6114(2)	0.1403(2)	4.2(2)
C(51)	0.3614(3)	0.4695(2)	0.1015(3)	3.4(2)
C(52)	0.2853(3)	0.4731(2)	0.0336(3)	4.3(2)
C(53)	0.2942(3)	0.4508(2)	-0.0403(3)	6.1(2)
C(54)	0.3791(3)	0.4250(2)	-0.0464(3)	6.4(3)
C(55)	0.4552(3)	0.4214(2)	0.0215(3)	6.3(3)
C(56)	0.4463(3)	0.4437(2)	0.0954(3)	4.6(2)
C(61)	0.3972(3)	0.3144(2)	0.2091(3)	3.2(2)
C(62)	0.4924(3)	0.3114(2)	0.2132(3)	4.7(2)
C(63)	0.5237(3)	0.2705(2)	0.1612(3)	6.0(2)
C(64)	0.4599(3)	0.2326(2)	0.1051(3)	6.3(3)
C(65)	0.3647(3)	0.2356(2)	0.1010(3)	6.1(2)
C(66)	0.3334(3)	0.2766(2)	0.1531(3)	4.3(2)
C(71)	0.4302(3)	0.3354(2)	0.3742(3)	2.7(1)
C(72)	0.5030(3)	0.3707(2)	0.4247(3)	4.4(2)
C(73)	0.5575(3)	0.3423(2)	0.4950(3)	6.0(2)
C(74)	0.5393(3)	0.2784(2)	0.5148(3)	5.5(2)
C(75)	0.4666(3)	0.2430(2)	0.4643(3)	4.7(2)
C(76)	0.4120(3)	0.2715(2)	0.3940(3)	3.8(2)
Disordered solvent molecules (MeOH)				
O(100)	0.6610(8)	0.4191(6)	0.3092(8)	19.(1)
C(100)	0.693(1)	0.4805(9)	0.324(1)	14.(1)
O(200)	0.7863(7)	0.3218(7)	0.356(1)	20.(1)
C(200)	0.761(1)	0.2614(8)	0.3676(9)	14.(1)

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Table S7: Final anisotropic thermal parameters (U_{ij} x 100) for **6**, with Esd's in parentheses.

Atom	U11	U22	U33	U12	U13	U23
Ru(1)	2.33(3)	2.66(3)	2.64(3)	0.05(2)	0.81(2)	0.29(2)
Ru(2)	2.28(3)	2.44(3)	2.27(3)	-0.04(2)	0.66(2)	-0.11(2)
Ru(3)	2.15(3)	2.23(3)	2.53(3)	-0.06(2)	0.72(2)	-0.21(2)
C(1)	2.7(4)	4.1(5)	3.7(4)	0.3(3)	1.3(3)	-0.3(4)
O(1)	6.7(4)	4.4(4)	7.0(4)	1.6(3)	2.6(3)	3.3(3)
C(2)	3.0(4)	3.2(4)	2.9(4)	0.1(3)	0.9(3)	0.2(3)
O(2)	5.6(4)	3.4(3)	4.3(3)	-1.8(3)	1.4(3)	-0.5(2)
C(3)	3.4(4)	2.9(4)	3.9(4)	-0.1(3)	0.8(3)	-0.1(3)
O(3)	3.9(3)	6.6(4)	6.9(4)	-0.3(3)	-1.1(3)	-1.3(3)
C(4)	3.4(4)	3.8(4)	2.7(4)	-0.1(3)	0.8(3)	-0.1(3)
O(4)	7.7(4)	5.6(4)	6.3(4)	1.1(3)	3.3(4)	-1.5(3)
C(5)	2.7(4)	3.9(5)	4.5(4)	-0.4(3)	1.3(3)	-0.2(4)
O(5)	6.9(4)	2.7(3)	9.5(5)	-0.5(3)	3.1(4)	0.0(3)
C(6)	3.5(4)	2.7(4)	3.4(4)	0.2(3)	0.4(3)	-0.2(3)
O(6)	6.0(4)	5.6(4)	2.6(3)	0.1(3)	0.6(2)	-0.5(3)
C(7)	2.7(4)	2.3(4)	4.5(4)	0.1(3)	1.4(3)	0.3(3)
O(7)	3.6(3)	6.3(4)	5.0(3)	-1.6(3)	1.5(3)	0.4(3)
C(9)	2.5(3)	2.3(3)	2.7(3)	0.4(3)	1.3(3)	-0.2(3)
C(10)	1.9(3)	2.8(4)	3.4(4)	-0.3(3)	1.0(3)	-0.6(3)
C(20)	2.6(3)	2.3(4)	2.9(3)	-0.2(3)	0.4(3)	0.0(3)
C(30)	3.1(4)	3.0(4)	3.0(4)	-0.1(3)	1.0(3)	-0.1(3)
P(1)	2.45(9)	2.4(1)	3.12(9)	-0.04(7)	1.02(7)	0.14(7)
C(8)	1.9(3)	2.5(4)	4.0(4)	-0.1(3)	1.1(3)	0.1(3)
P(2)	2.40(8)	2.18(9)	2.84(9)	0.11(7)	0.69(7)	-0.10(7)
C(11)	2.1(3)	2.9(4)	2.9(3)	0.2(3)	0.9(3)	-0.1(3)
C(12)	2.9(4)	4.0(4)	3.2(4)	0.3(3)	0.8(3)	-0.1(3)
C(13)	3.3(4)	5.1(5)	2.9(4)	0.2(4)	0.0(3)	0.4(3)
C(14)	3.6(4)	4.7(5)	4.0(4)	1.1(4)	0.5(3)	0.9(4)
C(15)	5.0(5)	4.0(4)	4.4(4)	1.4(4)	1.7(4)	0.5(4)
C(16)	3.3(4)	3.5(4)	2.9(4)	-0.2(3)	1.1(3)	0.1(3)
C(21)	2.9(4)	3.0(4)	3.7(4)	-0.3(3)	0.9(3)	-0.1(3)
C(22)	2.8(4)	3.9(5)	5.2(5)	-0.5(3)	0.4(3)	-1.0(4)
C(23)	4.6(5)	6.6(6)	6.6(6)	-1.8(5)	0.7(5)	-2.7(5)
C(24)	3.8(5)	9.9(8)	5.5(6)	-1.7(5)	-1.3(4)	-1.3(6)
C(25)	2.5(4)	8.4(7)	8.3(7)	0.5(5)	0.3(4)	-1.6(6)
C(26)	3.3(4)	6.0(6)	5.4(5)	-0.3(4)	0.7(4)	-1.9(4)
C(31)	3.0(4)	3.0(4)	3.5(4)	-0.5(3)	1.4(3)	0.5(3)
C(32)	5.7(5)	4.8(5)	4.0(4)	0.3(4)	2.2(4)	0.3(4)
C(33)	7.4(7)	7.2(7)	5.4(6)	-1.9(6)	4.5(5)	-1.0(5)
C(34)	6.3(6)	13.(1)	3.5(5)	-3.7(7)	1.9(5)	-0.2(6)
C(35)	5.6(6)	13.(1)	4.5(5)	0.1(6)	1.1(5)	4.3(6)
C(36)	4.3(5)	8.3(7)	4.6(5)	1.5(5)	1.8(4)	2.6(5)
Disordered solvent molecules						
O(100)	15.(1)	13.7(9)	29.(2)	-9.8(8)	14.(1)	-9.(1)
C(100)	9.(1)	15.(2)	17.(2)	0.(1)	5.(1)	-4.(1)
O(200)	8.5(8)	16.(1)	37.(2)	-0.4(8)	4.(1)	7.(1)
C(200)	20.(2)	11.(1)	12.(1)	-1.(1)	7.(1)	-1.(1)

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Table S8: Hydrogen positional and thermal parameters (U x 100) for **6**, with Esd's in parentheses.

Atom	x/a	y/b	z/c	U(A x100)
H(12)	0.014	0.452	0.116	4.0
H(13)	-0.067	0.532	0.028	5.0
H(14)	-0.080	0.639	0.073	5.0
H(15)	-0.011	0.666	0.207	5.0
H(16)	0.077	0.589	0.295	4.0
H(22)	0.006	0.307	0.164	4.0
H(23)	-0.140	0.283	0.073	5.0
H(24)	-0.272	0.346	0.075	5.0
H(25)	-0.262	0.427	0.173	5.0
H(26)	-0.116	0.448	0.267	4.0
H(32)	0.052	0.450	0.508	4.0
H(33)	0.062	0.447	0.646	5.0
H(34)	0.166	0.375	0.731	5.0
H(35)	0.262	0.308	0.677	5.0
H(36)	0.255	0.312	0.540	4.0
H(42)	0.479	0.569	0.331	4.0
H(43)	0.569	0.666	0.343	5.0
H(44)	0.568	0.729	0.227	5.0
H(45)	0.476	0.694	0.100	5.0
H(46)	0.386	0.597	0.088	4.0
H(52)	0.226	0.491	0.038	4.0
H(53)	0.241	0.453	-0.087	5.0
H(54)	0.385	0.410	-0.098	5.0
H(55)	0.514	0.403	0.017	5.0
H(56)	0.499	0.441	0.143	4.0
H(62)	0.537	0.338	0.252	4.0
H(63)	0.590	0.268	0.164	5.0
H(64)	0.482	0.204	0.069	5.0
H(65)	0.320	0.209	0.062	5.0
H(66)	0.267	0.279	0.150	4.0
H(72)	0.516	0.415	0.411	4.0
H(73)	0.608	0.367	0.530	5.0
H(74)	0.577	0.259	0.564	5.0
H(75)	0.454	0.199	0.478	5.0
H(76)	0.361	0.247	0.359	4.0

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Table S9: Interatomic Distances (Å) for **6**, with Esd's in parentheses.

Ru-Ru			
Ru(1)-Ru(3)	3.0017(9)	Ru(1)-Ru(2)	2.8969(8)
Ru(2)-Ru(3)	2.7905(8)		
Ru-P			
Ru(1)-P(1)	2.252(2)	Ru(3)-P(2)	2.354(2)
Ru-C (carbonyl groups)			
Ru(1)-C(1)	1.843(7)	Ru(1)-C(2)	1.973(6)
Ru(2)-C(2)	2.175(7)	Ru(2)-C(3)	1.928(6)
Ru(2)-C(4)	1.867(8)	Ru(3)-C(5)	1.905(8)
Ru(3)-C(6)	1.919(7)		
Ru-C (side-on linkage of C-Ph bond)			
Ru(1)-C(11)	2.343(7)	Ru(1)-C(9)	2.564(7)
Ru-C (sigma bonds, bis-alkenyl ketone ligand)			
Ru(2)-C(9)	2.090(5)	Ru(3)-C(20)	2.076(6)
Ru-C (π bonds, bis-alkenyl ketone ligand)			
Ru(3)-C(9)	2.351(6)	Ru(3)-C(10)	2.302(7)
Ru(2)-C(20)	2.205(7)	Ru(2)-C(30)	2.331(7)
C-O (carbonyl groups)			
C(1)-O(1)	1.147(9)	C(2)-O(2)	1.160(8)
C(3)-O(3)	1.129(8)	C(4)-O(4)	1.15(1)
	C(5)-O(5) 1.125(9)		C(6)-O(6)
1.150(8)			
C-O (bis-alkenyl ketone ligand)			
C(7)-O(7)	1.213(9)		

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Table S9 (continued)

C-C (bis-alkenyl ketone ligand)

C(9)-C(10)	1.418(9)	C(10)-C(7)	1.49(1)
C(7)-C(30)	1.505(8)	C(30)-C(20)	1.40(1)
C(9)-C(11)	1.492(8)	C(10)-C(21)	1.504(8)
C(30)-C(31)	1.496(9)		

C-H (bis-alkenyl ketone ligand)

C(20)-H(20)	0.90(7)

C-C (within the phenyl substituents of the bis-alkenyl ketone ligand)

C(11)-C(12)	1.419(9)	C(11)-C(16)	1.41(1)
C(12)-C(13)	1.38(1)	C(13)-C(14)	1.38(1)
C(14)-C(15)	1.36(1)	C(15)-C(16)	1.39(1)
C(21)-C(22)	1.36(1)	C(21)-C(26)	1.40(1)
C(22)-C(23)	1.39(1)	C(23)-C(24)	1.38(1)
C(24)-C(25)	1.37(1)	C(25)-C(26)	1.40(1)
C(31)-C(32)	1.38(1)	C(31)-C(36)	1.37(1)
C(32)-C(33)	1.39(1)	C(33)-C(34)	1.36(1)
C(34)-C(35)	1.37(1)	C(35)-C(36)	1.39(1)

P-C bonds within the bis(diphenylphosphino)methane ligand

P(1)-C(8)	1.826(7)	P(2)-C(8)	1.826(7)
P(1)-C(41)	1.832(5)	P(1)-C(51)	1.820(5)
P(2)-C(61)	1.839(5)	P(2)-C(71)	1.832(4)

C-C (within the phenyl substituents of the dppm ligand)

rigid groups: C-C = 1.395

C-H (within the phenyl substituents of the dppm ligand)

riding position: C-H = 0.97

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Table S10: Bond angles (deg.) for **6**, with Esd's in parentheses.

Ru-Ru-Ru			
Ru(2)-Ru(1)-Ru(3)	56.43(2)	Ru(2)-Ru(3)-Ru(1)	59.89(2)
Ru(1)-Ru(2)-Ru(3)	63.68(2)		
P-Ru-Ru			
P(1)-Ru(1)-Ru(2)	107.93(5)	P(1)-Ru(1)-Ru(3)	91.73(5)
P(2)-Ru(3)-Ru(2)	96.35(4)	P(2)-Ru(3)-Ru(1)	88.61(5)
C(bis-alkenyl ketone)-Ru-Ru			
C(9)-Ru(3)-Ru(1)	55.6(2)	C(9)-Ru(2)-Ru(1)	59.3(2)
C(9)-Ru(3)-Ru(2)	47.0(1)	C(9)-Ru(2)-Ru(3)	55.4(2)
C(10)-Ru(3)-Ru(1)	88.9(2)	C(10)-Ru(3)-Ru(2)	71.5(2)
C(20)-Ru(3)-Ru(1)	110.4(2)	C(20)-Ru(2)-Ru(1)	110.2(2)
C(20)-Ru(3)-Ru(2)	51.3(2)	C(20)-Ru(2)-Ru(3)	47.3(2)
C(30)-Ru(2)-Ru(1)	130.1(1)	C(30)-Ru(2)-Ru(3)	70.6(2)
C(11)-Ru(1)-Ru(2)	73.3(2)	C(11)-Ru(1)-Ru(3)	78.9(2)
C-C-Ru			
C(9)-C(11)-Ru(1)	80.6(4)	C(11)-C(9)-Ru(3)	125.0(5)
C(11)-C(9)-Ru(2)	122.9(4)	C(10)-C(9)-Ru(3)	70.4(4)
C(10)-C(9)-Ru(2)	116.4(4)	C(9)-C(10)-Ru(3)	74.1(4)
C(7)-C(10)-Ru(3)	103.4(4)	C(7)-C(30)-Ru(2)	104.6(4)
C(30)-C(20)-Ru(2)	77.0(4)	C(30)-C(20)-Ru(3)	117.1(4)
C(20)-C(30)-Ru(2)	67.2(4)	C(10)-C(9)-Ru(3)	70.4(4)
Ru-Ru-C(carbonyl)			
Ru(3)-Ru(1)-C(1)	157.7(2)	Ru(2)-Ru(1)-C(1)	145.0(2)
Ru(2)-Ru(1)-C(2)	48.6(2)	Ru(1)-Ru(2)-C(2)	42.9(2)
Ru(1)-Ru(2)-C(3)	116.3(2)	Ru(1)-Ru(2)-C(4)	118.1(2)
Ru(3)-Ru(2)-C(3)	113.0(2)	Ru(3)-Ru(2)-C(4)	154.5(2)
Ru(2)-Ru(3)-C(5)	136.9(2)	Ru(1)-Ru(3)-C(5)	162.8(2)
Ru(1)-Ru(3)-C(6)	69.3(2)	Ru(2)-Ru(3)-C(6)	127.9(2)

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Table S10 (continued)

Ru-C-O

Ru(1)-C(1)-O(1)	178.2(7)	Ru(1)-C(2)-O(2)	138.6(6)
Ru(2)-C(2)-O(2)	132.9(5)	Ru(2)-C(3)-O(3)	176.5(7)
Ru(2)-C(4)-O(4)	179.1(7)	Ru(3)-C(5)-O(5)	178.7(6)
Ru(3)-C(6)-O(6)	169.7(6)		

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Table S11: Final atomic coordinates and isotropic or equivalent temperature factors ($Å^2$ x 100) for **8**, with Esd's in parentheses.

Atom	x/a	y/b	z/c	Ueq/Uiso
Ru(1)	-0.07593(5)	0.09436(3)	0.82483(4)	3.83(4)
Ru(2)	0.13341(5)	0.07816(3)	0.92086(4)	4.16(4)
Ru(3)	0.10702(5)	0.13883(3)	0.78853(4)	3.96(4)
C(1)	-0.1408(8)	0.0204(5)	0.7702(6)	6.0(7)
O(1)	-0.1780(7)	-0.0228(4)	0.7402(5)	10.0(6)
C(2)	-0.1649(7)	0.0935(4)	0.8861(5)	5.0(6)
O(2)	-0.2191(5)	0.0926(4)	0.9220(4)	7.8(5)
C(3)	0.1703(8)	0.0636(5)	1.0245(6)	5.9(6)
O(3)	0.1948(6)	0.0545(4)	1.0897(4)	9.3(6)
C(4)	0.1799(8)	-0.0013(5)	0.9066(6)	6.6(7)
O(4)	0.2050(7)	-0.0489(4)	0.8978(5)	11.0(7)
C(5)	0.1920(8)	0.1359(5)	0.7222(5)	6.3(7)
O(5)	0.2431(6)	0.1332(4)	0.6825(4)	9.4(6)
C(6)	0.0485(8)	0.0661(5)	0.7371(6)	7.0(7)
O(6)	0.0357(7)	0.0211(4)	0.7031(5)	11.5(7)
C(7)	0.1891(6)	0.2103(4)	0.9417(5)	4.3(5)
O(7)	0.2366(5)	0.2471(3)	0.9906(4)	6.6(4)
P(1)	-0.1880(2)	0.1588(1)	0.7376(1)	4.0(1)
P(2)	0.0015(2)	0.2138(1)	0.7065(1)	4.4(1)
C(8)	-0.1313(7)	0.1846(4)	0.6645(5)	4.4(6)
C(9)	0.2471(6)	0.1242(4)	0.8861(4)	4.3(5)
C(10)	0.2334(6)	0.1893(4)	0.8803(4)	3.9(5)
C(20)	0.0343(6)	0.1548(4)	0.8722(4)	3.8(5)
C(30)	0.0896(6)	0.1800(4)	0.9403(4)	3.8(5)
C(11)	0.3445(4)	0.0910(3)	0.8896(3)	4.9(2)
C(12)	0.3483(4)	0.0434(3)	0.8397(3)	6.3(3)
C(13)	0.4413(4)	0.0128(3)	0.8474(3)	7.9(3)
C(14)	0.5306(4)	0.0297(3)	0.9051(3)	9.8(4)
C(15)	0.5268(4)	0.0772(3)	0.9550(3)	8.8(4)
C(16)	0.4338(4)	0.1079(3)	0.9472(3)	6.3(3)
C(21)	0.2997(5)	0.2348(2)	0.8517(4)	5.1(2)
C(22)	0.3756(5)	0.2154(2)	0.8199(4)	5.7(2)
C(23)	0.4280(5)	0.2583(2)	0.7890(4)	6.9(3)
C(24)	0.4044(5)	0.3206(2)	0.7898(4)	7.9(3)
C(25)	0.3285(5)	0.3400(2)	0.8216(4)	9.1(4)
C(26)	0.2761(5)	0.2971(2)	0.8526(4)	7.6(3)
C(31)	0.0388(4)	0.1989(2)	0.9994(3)	4.1(2)
C(32)	-0.0091(4)	0.1564(2)	1.0343(3)	5.3(2)
C(33)	-0.0656(4)	0.1765(2)	1.0818(3)	6.7(3)
C(34)	-0.0742(4)	0.2391(2)	1.0943(3)	7.2(3)
C(35)	-0.0263(4)	0.2817(2)	1.0594(3)	6.3(3)
C(36)	0.0302(4)	0.2616(2)	1.0120(3)	5.5(2)
C(41)	-0.3085(5)	0.1219(3)	0.6855(3)	4.7(2)
C(42)	-0.3237(5)	0.0956(3)	0.6138(3)	7.4(3)

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Table S11 (continued)

Atom	x/a	y/b	z/c	Ueq/Uiso
C(43)	-0.4142(5)	0.0629(3)	0.5791(3)	9.2(4)
C(44)	-0.4895(5)	0.0564(3)	0.6161(3)	8.3(3)
C(45)	-0.4743(5)	0.0827(3)	0.6878(3)	8.3(3)
C(46)	-0.3838(5)	0.1154(3)	0.7225(3)	6.5(3)
C(51)	-0.2316(4)	0.2283(2)	0.7718(3)	4.1(2)
C(52)	-0.2022(4)	0.2417(2)	0.8496(3)	4.9(2)
C(53)	-0.2381(4)	0.2951(2)	0.8750(3)	6.0(3)
C(54)	-0.3033(4)	0.3350(2)	0.8227(3)	6.2(3)
C(55)	-0.3326(4)	0.3215(2)	0.7450(3)	6.4(3)
C(56)	-0.2968(4)	0.2682(2)	0.7196(3)	5.2(2)
C(61)	-0.0221(5)	0.2903(3)	0.7370(3)	4.8(2)
C(62)	0.0100(5)	0.3055(3)	0.8143(3)	6.8(3)
C(63)	-0.0106(5)	0.3638(3)	0.8376(3)	9.2(4)
C(64)	-0.0632(5)	0.4069(3)	0.7837(3)	9.0(4)
C(65)	-0.0953(5)	0.3917(3)	0.7064(3)	9.5(4)
C(66)	-0.0747(5)	0.3335(3)	0.6831(3)	7.8(3)
C(71)	0.0437(5)	0.2328(3)	0.6247(3)	5.8(3)
C(72)	0.1216(5)	0.2768(3)	0.6360(3)	7.7(3)
C(73)	0.1613(5)	0.2920(3)	0.5766(3)	9.1(4)
C(74)	0.1229(5)	0.2631(3)	0.5060(3)	9.2(4)
C(75)	0.0450(5)	0.2191(3)	0.4947(3)	9.5(4)
C(76)	0.0053(5)	0.2040(3)	0.5540(3)	7.6(3)
HYD	0.005(5)	0.039(3)	0.907(4)	5.00(0)
Disordered acetone (solvent) molecule				
C(105)	0.322(4)	0.506(3)	0.990(3)	39.(6)
C(107)	0.264(3)	0.481(2)	0.935(2)	28.(4)
C(108)	0.328(5)	0.557(2)	1.014(2)	32.(5)
C(109)	0.342(3)	0.449(2)	1.010(2)	31.(5)

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Table S12: Final anisotropic thermal parameters (U_{ij} x 100) for **8**, with Esd's in parentheses.

Atom	U11	U22	U33	U12	U13	U23
Ru(1)	3.66(4)	4.05(4)	3.79(4)	-0.17(3)	0.64(3)	0.01(3)
Ru(2)	3.80(4)	4.45(4)	4.23(4)	0.37(3)	0.78(3)	0.52(3)
Ru(3)	3.62(4)	4.87(5)	3.39(4)	0.28(3)	0.95(3)	-0.31(3)
C(1)	6.7(7)	4.9(6)	6.5(7)	0.2(5)	1.4(5)	0.1(5)
O(1)	13.3(7)	5.3(5)	11.4(7)	-2.9(5)	2.6(6)	-2.8(5)
C(2)	4.6(6)	5.0(6)	5.2(6)	-0.8(5)	0.5(5)	0.2(5)
O(2)	5.9(4)	10.6(6)	7.0(5)	-1.0(4)	3.6(4)	0.6(4)
C(3)	6.6(7)	6.5(7)	4.5(6)	0.4(5)	0.2(5)	1.7(5)
O(3)	10.5(6)	11.6(7)	5.7(5)	-0.4(5)	0.0(5)	2.4(5)
C(4)	6.0(7)	5.1(7)	8.6(8)	0.5(5)	2.9(6)	0.9(6)
O(4)	11.9(7)	4.7(5)	16.4(9)	2.4(5)	6.8(6)	0.6(5)
C(5)	6.1(6)	8.0(8)	4.8(6)	0.3(6)	2.0(5)	-1.3(5)
O(5)	7.8(5)	13.7(8)	6.6(5)	1.6(5)	3.6(4)	-0.9(5)
C(6)	6.2(7)	7.8(8)	7.0(7)	-0.6(6)	2.3(6)	-2.7(6)
O(6)	12.2(7)	9.8(6)	12.5(7)	-3.9(6)	6.5(6)	-6.7(6)
C(7)	4.2(5)	3.8(5)	4.9(5)	-0.2(4)	1.3(4)	-0.3(4)
O(7)	5.1(4)	7.8(5)	6.9(4)	-1.9(4)	2.5(3)	-3.2(4)
P(1)	3.5(1)	4.6(1)	3.8(1)	-0.2(1)	0.5(1)	0.0(1)
P(2)	3.7(1)	5.8(2)	3.6(1)	-0.1(1)	1.0(1)	0.6(1)
C(8)	4.1(5)	4.7(6)	4.3(6)	0.1(5)	0.6(4)	0.1(4)
C(9)	3.8(5)	5.6(6)	3.5(5)	0.1(4)	1.0(4)	-0.5(4)
C(10)	3.4(5)	4.8(5)	3.5(5)	0.3(4)	0.7(4)	-0.7(4)
C(20)	3.6(5)	3.8(5)	4.0(5)	0.2(4)	0.9(4)	0.7(4)
C(30)	3.8(5)	4.2(5)	3.3(5)	0.0(4)	1.2(4)	-0.6(4)
Disordered solvent molecule						
C(105)	46.(6)	32.(6)	38.(5)	-21.(5)	-11.(4)	16.(5)
C(107)	20.(3)	22.(3)	43.(5)	8.(3)	-1.(3)	-11.(3)
C(108)	48.(8)	20.(3)	27.(4)	-13.(4)	6.(4)	-12.(3)
C(109)	26.(4)	32.(4)	33.(5)	13.(4)	16.(4)	10.(4)

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Table S13: Hydrogen positional and thermal parameters (U x 100) for **8**, with Esd's in parentheses.

Atom	x/a	y/b	z/c	U(A x100)
HYD	0.005(5)	0.039(3)	0.907(4)	5.0
H(81)	-0.125(7)	0.156(4)	0.644(5)	5.0
H(82)	-0.187(6)	0.213(4)	0.630(4)	5.0
H(12)	0.286	0.032	0.800	7.2
H(13)	0.444	-0.020	0.813	9.2
H(14)	0.595	0.008	0.910	10.1
H(15)	0.589	0.089	0.995	9.3
H(16)	0.431	0.141	0.982	7.3
H(22)	0.392	0.172	0.819	7.0
H(23)	0.481	0.245	0.767	7.5
H(24)	0.441	0.350	0.768	8.9
H(25)	0.312	0.383	0.822	10.3
H(26)	0.223	0.311	0.875	8.3
H(32)	-0.003	0.113	1.026	6.0
H(33)	-0.099	0.147	1.106	7.5
H(34)	-0.113	0.253	1.127	7.9
H(35)	-0.032	0.325	1.068	7.4
H(36)	0.064	0.291	0.988	6.5
H(42)	-0.271	0.100	0.588	8.2
H(43)	-0.425	0.045	0.529	10.4
H(44)	-0.552	0.034	0.592	9.7
H(45)	-0.527	0.078	0.714	9.1
H(46)	-0.373	0.134	0.772	7.7
H(52)	-0.157	0.214	0.886	6.1
H(53)	-0.218	0.304	0.929	7.0
H(54)	-0.328	0.372	0.840	7.6
H(55)	-0.378	0.349	0.709	7.4
H(56)	-0.317	0.259	0.666	6.4
H(62)	0.047	0.276	0.852	7.7
H(63)	0.012	0.374	0.891	10.3
H(64)	-0.078	0.447	0.800	10.1
H(65)	-0.132	0.422	0.669	10.2
H(66)	-0.097	0.323	0.629	8.4
H(72)	0.148	0.297	0.685	8.5
H(73)	0.215	0.323	0.584	10.3
H(74)	0.150	0.274	0.465	10.2
H(75)	0.018	0.199	0.446	10.1
H(76)	-0.049	0.173	0.546	8.6

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Table S14: Interatomic Distances (Å) for **8**, with Esd's in parentheses.

Ru-Ru					
Ru(1)-Ru(3)	2.921(1)			Ru(1)-Ru(2)	2.8731(9)
Ru(2)-Ru(3)	2.698(1)				
Ru-Hydride					
Ru(1)-Hyd	1.98(6)			Ru(2)-Hyd	1.89(7)
Ru-P					
Ru(1)-P(1)	2.319(2)			Ru(3)-P(2)	2.384(2)
Ru-C (carbonyl groups)					
Ru(1)-C(1)	1.96(1)			Ru(1)-C(2)	1.88(1)
Ru(2)-C(3)	1.85(1)			Ru(2)-C(4)	1.89(1)
	Ru(3)-C(5)	1.92(1)			Ru(3)-C(6)
1.89(1)					
Ru-C (sigma bonds, alkenyl - vinylidene-ketyl ligand)					
Ru(1)-C(20)	1.984(7)			Ru(3)-C(20)	2.093(9)
Ru(2)-C(9)	2.094(9)				
Ru-C (π bonds, alkenyl - vinylidene-ketyl ligand)					
Ru(3)-C(9)	2.204(7)			Ru(3)-C(10)	2.289(7)
Ru(2)-C(20)	2.160(7)			Ru(2)-C(30)	2.351(8)
C-O (carbonyl groups)					
C(1)-O(1)	1.13(1)			C(2)-O(2)	1.13(1)
C(3)-O(3)	1.16(1)			C(4)-O(4)	1.12(1)
	C(5)-O(5)	1.15(1)			C(6)-O(6)
1.15(1)					
C-O (ketyl group)					
C(7)-O(7)	1.23(1)				

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Table S14 (continued)

C-C (alkenyl - vinylidene-ketyl ligand)

C(9)-C(10)	1.43(1)	C(10)-C(7)	1.50(1)
C(7)-C(30)	1.49(1)	C(30)-C(20)	1.36(1)
C(9)-C(11)	1.49(1)	C(10)-C(21)	1.53(1)
C(30)-C(31)	1.51(1)		

P-C bonds within the bis(diphenylphosphino)methane ligand

P(1)-C(8)	1.82(1)	P(2)-C(8)	1.843(9)
P(1)-C(41)	1.813(6)	P(1)-C(51)	1.805(6)
P(2)-C(61)	1.818(6)	P(2)-C(71)	1.814(7)

C-C (within phenyl substituents , all treated as rigid groups)

< C-C > =	1.395
< C-H > =	0.97

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Table S15: Bond angles (deg.) for **8**, with Esd's in parentheses.

Ru-Ru-Ru

Ru(2)-Ru(1)-Ru(3)	55.49(2)	Ru(2)-Ru(3)-Ru(1)	61.34(2)
Ru(1)-Ru(2)-Ru(3)	63.16(2)		

P-Ru-Ru

P(1)-Ru(1)-Ru(2)	144.81(6)	P(1)-Ru(1)-Ru(3)	93.64(6)
P(2)-Ru(3)-Ru(2)	142.87(7)	P(2)-Ru(3)-Ru(1)	89.12(6)

C(vinylidene-alkenyl ketyl)-Ru-Ru

C(9)-Ru(3)-Ru(1)	110.2(2)	C(9)-Ru(2)-Ru(1)	115.7(2)
C(9)-Ru(3)-Ru(2)	49.3(2)	C(9)-Ru(2)-Ru(3)	53.0(2)
C(10)-Ru(3)-Ru(1)	119.2(2)	C(10)-Ru(3)-Ru(2)	72.8(2)
C(20)-Ru(3)-Ru(1)	42.7(2)	C(20)-Ru(2)-Ru(1)	43.6(2)
C(20)-Ru(3)-Ru(2)	51.7(2)	C(20)-Ru(2)-Ru(3)	49.5(2)
C(30)-Ru(2)-Ru(1)	74.3(2)	C(30)-Ru(2)-Ru(3)	72.8(2)

C-C-Ru

C(11)-C(9)-Ru(2)	118.6(5)	C(11)-C(9)-Ru(3)	129.6(5)
C(10)-C(9)-Ru(2)	114.1(6)	C(10)-C(9)-Ru(3)	74.7(4)
C(9)-C(10)-Ru(3)	68.2(4)	C(7)-C(10)-Ru(3)	108.7(5)
C(7)-C(30)-Ru(2)	98.7(5)	C(20)-C(30)-Ru(2)	64.8(4)
C(30)-C(20)-Ru(1)	143.1(7)	C(30)-C(20)-Ru(3)	119.5(6)
C(30)-C(20)-Ru(2)	80.2(4)	C(20)-C(30)-Ru(2)	64.8(4)

Ru-Ru-C(carbonyl)

Ru(3)-Ru(1)-C(1)	115.7(3)	Ru(2)-Ru(1)-C(1)	114.8(3)
Ru(2)-Ru(1)-C(2)	108.8(2)	Ru(3)-Ru(1)-C(2)	151.8(2)
Ru(1)-Ru(2)-C(3)	124.3(3)	Ru(1)-Ru(2)-C(4)	109.6(3)
Ru(3)-Ru(2)-C(3)	159.5(3)	Ru(3)-Ru(2)-C(4)	106.4(3)
Ru(2)-Ru(3)-C(5)	128.2(3)	Ru(1)-Ru(3)-C(5)	148.2(3)
Ru(1)-Ru(3)-C(6)	65.2(4)	Ru(2)-Ru(3)-C(6)	87.8(3)

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Table S15 (continued)

Ru-C-O

Ru(1)-C(1)-O(1)	178.5(9)	Ru(1)-C(2)-O(2)	179.0(7)
Ru(2)-C(3)-O(3)	179.1(9)	Ru(2)-C(4)-O(4)	178.3(9)
Ru(3)-C(5)-O(5)	178.9(9)	Ru(3)-C(6)-O(6)	163.(1)

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Table S16. Atomic coordinates and U_{eq} x 100 (or U_{iso} x 100) for **9b** with Esd's in parentheses.

Atom	x/a	y/b	z/c	Ueq/Uiso
Ru(1)	0.29669(1)	0.13137(2)	0.83139(1)	3.08(1)
Ru(2)	0.29752(1)	-0.10575(2)	0.94995(1)	2.98(1)
C(1)	0.2211(2)	0.2964(4)	0.8127(2)	4.4(2)
O(1)	0.1823(2)	0.4013(3)	0.8001(2)	6.9(2)
C(2)	0.3327(2)	0.2067(4)	0.7329(2)	4.8(2)
O(2)	0.3549(1)	0.2503(4)	0.6755(2)	8.4(2)
C(3)	0.3561(2)	0.2503(4)	0.9230(2)	4.5(2)
O(3)	0.3955(2)	0.3101(3)	0.9789(2)	6.9(2)
C(4)	0.2432(2)	-0.0052(3)	1.0258(2)	3.7(2)
O(4)	0.2134(1)	0.0564(3)	1.0719(1)	5.5(1)
C(5)	0.3843(2)	-0.0950(4)	1.0443(2)	4.5(2)
O(5)	0.4362(1)	-0.0844(4)	1.0944(2)	7.4(2)
C(6)	0.2743(2)	-0.3232(4)	0.9737(2)	4.4(2)
O(6)	0.2631(1)	-0.4519(3)	0.9847(2)	7.6(2)
C(7)	0.2156(1)	-0.0645(3)	0.8383(2)	2.9(1)
C(8)	0.2361(1)	-0.0846(3)	0.7566(2)	3.0(1)
C(9)	0.2961(2)	-0.2052(3)	0.7615(2)	3.9(2)
O(9)	0.2989(1)	-0.2999(3)	0.7039(2)	6.4(2)
C(10)	0.3545(2)	-0.2009(3)	0.8434(2)	3.6(2)
C(11)	0.3743(2)	-0.0449(3)	0.8669(2)	3.4(2)
C(12)	0.4033(2)	-0.3460(4)	0.8642(2)	4.6(2)
C(13)	0.4659(2)	-0.3489(5)	0.8186(3)	6.0(2)
C(14)	0.5079(2)	-0.5064(5)	0.8360(4)	7.0(3)
C(71)	0.1378(1)	-0.0497(3)	0.8415(2)	3.2(2)
C(72)	0.0916(2)	-0.1767(4)	0.8103(2)	4.0(2)
C(73)	0.0201(2)	-0.1748(5)	0.8159(2)	5.2(2)
C(74)	-0.0080(2)	-0.0461(5)	0.8518(2)	5.4(2)
C(75)	0.0358(2)	0.0797(4)	0.8834(2)	5.1(2)
C(76)	0.1085(2)	0.0779(4)	0.8785(2)	3.9(2)

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Table S16 (continued)

Atom	x/a	y/b	z/c	Ueq/Uiso
C(81)	0.1836(1)	-0.0693(3)	0.6699(2)	3.4(2)
C(82)	0.1544(2)	-0.2055(4)	0.6244(2)	4.0(2)
C(83)	0.1085(2)	-0.1957(4)	0.5428(2)	4.5(2)
C(84)	0.0883(2)	-0.0490(5)	0.5062(2)	5.2(2)
C(85)	0.1149(2)	0.0868(4)	0.5509(2)	5.1(2)
C(86)	0.1624(2)	0.0767(4)	0.6309(2)	4.3(2)

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Table S17: Anisotropic thermal parameters (U_{ij} x 100) for **9b**, with Esd's in parentheses.

Atom	U11	U22	U33	U12	U13	U23
Ru(1)	3.37(2)	3.02(1)	2.83(1)	-0.21(1)	0.51(1)	0.12(1)
Ru(2)	3.11(2)	3.30(1)	2.54(1)	0.06(1)	0.43(1)	0.16(1)
C(1)	5.1(2)	4.1(2)	3.9(2)	0.2(1)	0.7(1)	0.0(1)
O(1)	7.5(2)	5.3(2)	7.9(2)	2.6(1)	0.8(2)	0.3(1)
C(2)	4.1(2)	5.5(2)	4.8(2)	0.1(1)	1.0(2)	1.1(2)
O(2)	7.5(2)	11.1(2)	6.6(2)	0.8(2)	3.6(2)	3.6(2)
C(3)	5.8(2)	3.4(2)	4.5(2)	-0.7(1)	0.3(2)	0.2(1)
O(3)	9.2(2)	5.8(2)	5.7(2)	-2.3(1)	-1.5(2)	-0.4(1)
C(4)	4.7(2)	3.5(2)	3.0(2)	0.1(1)	0.2(1)	0.3(1)
O(4)	7.0(2)	5.4(1)	4.2(1)	1.2(1)	2.1(1)	-0.5(1)
C(5)	4.3(2)	5.6(2)	3.7(2)	-0.1(1)	0.2(2)	0.5(1)
O(5)	5.3(2)	12.1(2)	4.8(2)	-1.0(2)	-1.2(1)	0.9(2)
C(6)	4.4(2)	4.3(2)	4.5(2)	0.4(1)	2.0(1)	0.2(1)
O(6)	8.8(2)	3.7(1)	10.2(2)	-0.2(1)	5.1(2)	0.4(1)
C(7)	3.1(2)	2.6(1)	3.0(1)	0.1(1)	0.6(1)	0.0(1)
C(8)	3.1(2)	3.3(1)	2.7(1)	-0.2(1)	0.7(1)	-0.2(1)
C(9)	3.6(2)	4.2(2)	3.8(2)	-0.1(1)	1.4(1)	-0.7(1)
O(9)	5.1(1)	8.0(2)	6.2(2)	2.0(1)	-0.1(1)	-3.7(1)
C(10)	3.3(2)	3.8(2)	3.7(2)	0.3(1)	1.1(1)	-0.1(1)
C(11)	2.8(2)	4.4(2)	3.0(2)	0.0(1)	0.8(1)	0.4(1)
C(12)	4.2(2)	4.2(2)	5.3(2)	0.8(1)	1.1(2)	0.1(2)
C(13)	5.3(2)	5.9(2)	6.7(3)	1.2(2)	2.1(2)	0.2(2)
C(14)	5.2(3)	5.3(2)	10.6(4)	1.0(2)	1.7(2)	-1.5(2)
C(71)	3.4(2)	4.1(2)	2.0(1)	0.3(1)	0.6(1)	0.2(1)
C(72)	3.7(2)	5.0(2)	3.2(2)	-0.4(1)	0.9(1)	-0.8(1)
C(73)	4.2(2)	7.4(2)	3.8(2)	-1.8(2)	0.6(2)	-0.6(2)
C(74)	2.7(2)	9.3(3)	4.2(2)	0.5(2)	0.8(1)	0.0(2)
C(75)	3.8(2)	6.9(2)	4.7(2)	1.2(2)	1.3(2)	-0.5(2)
C(76)	3.3(2)	4.4(2)	4.1(2)	0.4(1)	0.6(1)	-0.4(1)
C(81)	3.3(2)	4.4(2)	2.5(1)	-0.1(1)	1.0(1)	-0.2(1)
C(82)	3.9(2)	4.6(2)	3.5(2)	-0.6(1)	1.2(1)	-0.4(1)
C(83)	3.7(2)	6.6(2)	3.3(2)	-0.9(2)	0.7(1)	-1.1(2)
C(84)	4.2(2)	8.5(3)	2.8(2)	0.0(2)	0.1(1)	-0.3(2)
C(85)	5.4(2)	6.0(2)	4.0(2)	0.6(2)	0.4(2)	0.8(2)
C(86)	4.5(2)	4.7(2)	3.6(2)	0.0(1)	0.3(1)	-0.2(1)

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Table S18: Hydrogen positional and thermal parameters (U x 100) for **9b**, with Esd's in parentheses.

Atom	x/a	y/b	z/c	Ueq/Uiso
H(11)	0.423(2)	-0.026(3)	0.897(2)	3.3(7)
H(121)	0.375(2)	-0.444(4)	0.849(2)	5.7(9)
H(122)	0.431(2)	-0.331(5)	0.932(3)	9.(1)
H(131)	0.450(3)	-0.301(7)	0.756(4)	17.(3)
H(132)	0.501(2)	-0.247(5)	0.849(3)	10.(1)
H(141)	0.479(2)	-0.601(5)	0.816(3)	7.(1)
H(142)	0.529(2)	-0.520(6)	0.904(3)	10.(2)
H(143)	0.549(3)	-0.495(6)	0.806(3)	13.(2)
H(72)	0.108(1)	-0.255(3)	0.787(2)	2.2(7)
H(73)	-0.008(2)	-0.254(4)	0.795(2)	4.7(9)
H(74)	-0.053(2)	-0.044(4)	0.857(2)	4.9(9)
H(75)	0.016(2)	0.185(4)	0.909(2)	5.9(9)
H(76)	0.140(2)	0.163(3)	0.902(2)	3.5(7)
H(82)	0.171(2)	-0.305(4)	0.647(2)	4.3(8)
H(83)	0.092(2)	-0.290(4)	0.514(2)	5.0(9)
H(84)	0.054(2)	-0.050(4)	0.451(2)	6.(1)
H(85)	0.101(2)	0.188(4)	0.528(2)	6.(1)
H(86)	0.180(2)	0.161(4)	0.658(2)	4.1(9)

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Table S19. Interatomic distances for **9b** with Esd's in parentheses.

Ru-Ru				
	Ru(1)-Ru(2)	2.7164(6)		
Ru-C (carbonyl groups)				
	Ru(1)-C(1)	1.965(3)	Ru(2)-C(5)	1.957(3)
	Ru(1)-C(2)	1.919(4)	Ru(2)-C(6)	1.930(3)
	Ru(1)-C(3)	1.900(3)	Ru(2)-C(4)	1.921(3)
C-O				
	C(1)-O(1)	1.135(4)	C(5)-O(5)	1.120(4)
	C(2)-O(2)	1.129(5)	C(6)-O(6)	1.120(4)
	C(3)-O(3)	1.136(4)	C(4)-O(4)	1.131(4)
Ru-C (bis-vinyl ketyl group)				
	Ru(1)-C(7)	2.264(2)	Ru(2)-C(11)	2.204(3)
	Ru(1)-C(8)	2.320(2)	Ru(2)-C(10)	2.310(3)
	Ru(1)-C(11)	2.072(3)	Ru(2)-C(7)	2.096(2)
C-O (ketyl group)				
	C(9)-O(9)	1.210(4)		
C-C (bis-vinyl ketyl group)				
	C(7)-C(8)	1.422(4)	C(10)-C(11)	1.389(4)
	C(8)-C(9)	1.508(4)	C(9)-C(10)	1.499(4)
C-C and C-H (substituents)				
	C(7)-C(71)	1.487(4)	C(11)-H(11)	0.95(3)
	C(8)-C(81)	1.503(3)	C(10)-C(12)	1.520(4)
	C(12)-C(13)	1.506(6)	C(13)-C(14)	1.534(5)

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Table S19 (continued)

C-C (phenyl groups)

C(71)-C(72)	1.396(4)	C(81)-C(82)	1.395(4)
C(72)-C(73)	1.372(5)	C(82)-C(83)	1.382(4)
C(73)-C(74)	1.375(5)	C(83)-C(84)	1.376(5)
C(74)-C(75)	1.366(5)	C(84)-C(85)	1.373(5)
C(75)-C(76)	1.392(5)	C(85)-C(86)	1.377(4)
C(76)-C(71)	1.387(4)	C(86)-C(81)	1.388(4)

C-H (phenyl groups)

C(72)-H(72)	0.84(3)	C(82)-H(82)	0.94(3)
C(73)-H(73)	0.86(3)	C(83)-H(83)	0.93(3)
C(74)-H(74)	0.87(3)	C(84)-H(84)	0.96(3)
C(75)-H(75)	1.07(3)	C(85)-H(85)	0.93(3)
C(76)-H(76)	0.96(3)	C(86)-H(86)	0.85(3)

C-H (aliphatic chain)

C(12-H(121)	0.98(3)	C(12-H(122)	1.07(4)
C(13-H(131)	1.04(6)	C(13)-H(132)	1.11(4)
C(14-H(141)	0.97(4)	C(14-H(142)	1.06(4)
C(14)-H(143)	0.98(6)		

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Table S20. Interatomic bond angles for **9b**, with Esd's in parentheses.

Ru-Ru-C			
Ru(2)-Ru(1)-C(1)	120.96(9)	Ru(1)-Ru(2)-C(5)	111.16(9)
Ru(2)-Ru(1)-C(2)	146.87(9)	Ru(1)-Ru(2)-C(6)	148.75(8)
Ru(2)-Ru(1)-C(3)	87.40(9)	Ru(1)-Ru(2)-C(4)	100.00(8)
Ru(2)-Ru(1)-C(7)	48.74(6)	Ru(1)-Ru(2)-C(11)	48.45(7)
Ru(2)-Ru(1)-C(8)	72.63(6)	Ru(1)-Ru(2)-C(10)	72.33(7)
Ru(2)-Ru(1)-C(11)	52.75(8)	Ru(1)-Ru(2)-C(7)	54.29(7)
Ru-C-O			
Ru(1)-C(1)-O(1)	173.4(3)	Ru(2)-C(5)-O(5)	175.5(3)
Ru(1)-C(2)-O(2)	178.4(3)	Ru(2)-C(6)-O(6)	176.3(3)
Ru(1)-C(3)-O(3)	173.9(3)	Ru(2)-C(4)-O(4)	177.6(3)
C-Ru-C			
C(1)-Ru(1)-C(2)	91.2(1)	C(5)-Ru(2)-C(6)	94.9(1)
C(1)-Ru(1)-C(3)	91.9(1)	C(5)-Ru(2)-C(4)	89.2(1)
C(1)-Ru(1)-C(7)	92.3(1)	C(5)-Ru(2)-C(11)	83.2(1)
C(1)-Ru(1)-C(8)	102.2(1)	C(5)-Ru(2)-C(10)	96.5(1)
C(2)-Ru(1)-C(3)	100.2(1)	C(6)-Ru(2)-C(4)	97.0(1)
C(2)-Ru(1)-C(11)	95.6(1)	C(6)-Ru(2)-C(7)	99.1(1)
C(2)-Ru(1)-C(8)	94.2(1)	C(6)-Ru(2)-C(10)	88.4(1)
C(3)-Ru(1)-C(11)	84.5(1)	C(4)-Ru(2)-C(7)	92.5(1)
Ru-C-C			
Ru(1)-C(7)-C(8)	74.1(1)	Ru(2)-C(11)-C(10)	76.3(2)
Ru(1)-C(8)-C(7)	69.8(1)	Ru(2)-C(10)-C(11)	67.9(2)
Ru(1)-C(8)-C(9)	102.4(1)	Ru(2)-C(10)-C(9)	104.6(2)
Ru(1)-C(11)-C(10)	117.8(2)	Ru(2)-C(7)-C(8)	115.7(2)
C-C-C, C-C-H, C-C-O			
C(8)-C(7)-C(71)	120.1(2)	C(10)-C(11)-H(11)	117.(1)
C(7)-C(8)-C(9)	112.3(2)	C(11)-C(10)-C(9)	110.8(2)
C(7)-C(8)-C(81)	123.0(2)	C(11)-C(10)-C(12)	125.5(2)
C(9)-C(8)-C(81)	116.5(2)	C(9)-C(10)-C(12)	117.7(2)
C(8)-C(9)-O(9)	123.7(2)	C(10)-C(9)-O(9)	120.5(2)
C(8)-C(9)-C(10)	115.7(2)		