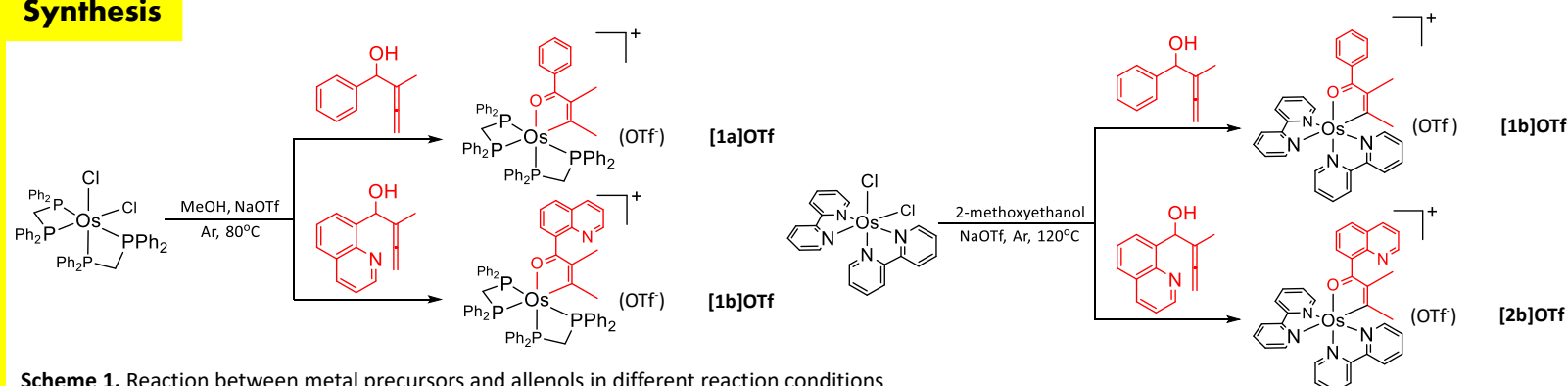


Introduction

Allenes are important in organic synthesis because of their axial chirality. In this paper, osmafuran complexes were synthesized through the reaction between allenols and either *cis*-[Os(dppm)₂Cl₂] or *cis*-[Os(bpy)₂Cl₂] (dppm = 1,1-bis(diphenylphosphino)methane; bpy = 2,2'-bipyridine) in alcoholic solvents. The complexes were well characterized and the mechanism was also investigated.

Synthesis

Scheme 1. Reaction between metal precursors and allenols in different reaction conditions

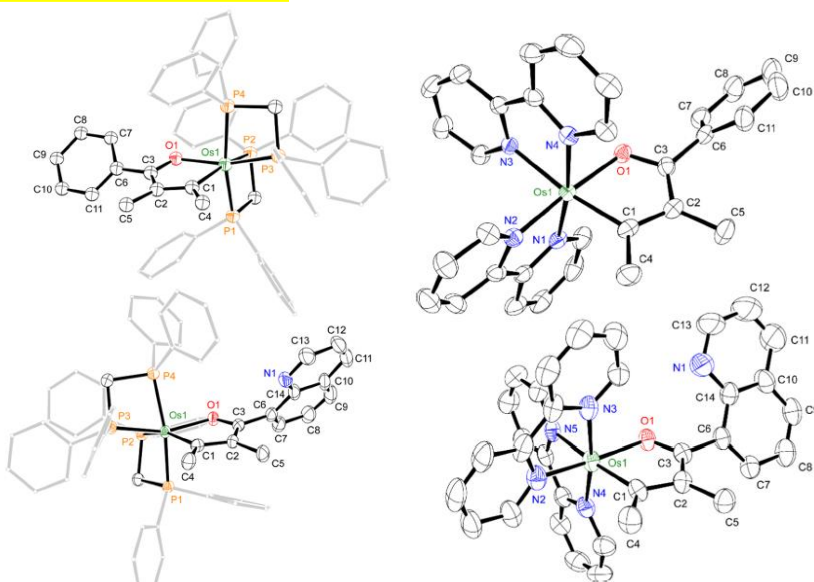
Characterization

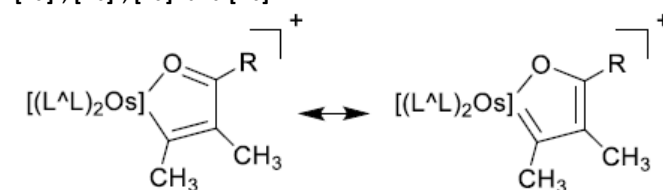
Figure 1. Perspective views of [1a]⁺ (up), [1b]⁺ (down)

Figure 2. Perspective views of [2a]⁺ (up), [2b]⁺ (down)

	[1a] ⁺	[1b] ⁺	[2a] ⁺	[2b] ⁺
Os–C1	2.076(3)	2.066(4)	1.985(4)	1.982(7)
Os–O1	2.106(2)	2.098(3)	2.076(2)	2.080(4)
C1–C2	1.374(5)	1.388(6)	1.392(5)	1.416(9)
C2–C3	1.412(5)	1.409(6)	1.395(5)	1.413(9)
C3–O1	1.283(4)	1.282(4)	1.297(4)	1.276(7)
C1–C4	1.504(5)	1.498(5)	1.506(6)	1.482(9)
C2–C5	1.519(5)	1.506(5)	1.511(5)	1.506(9)
C1–Os–O1	76.1(1)	76.7(1)	78.5(1)	78.5(2)
∠furan ^a	539.7	539.7	539.4	540.0

^aSum of the interior angles of the metallafuran system.

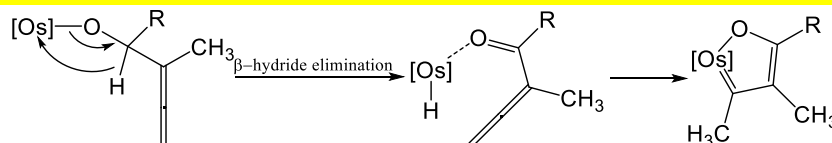
Table 1. Selected bond lengths (Å) and bond angles of [1a]⁺, [1b]⁺, [2a]⁺ and [2b]⁺



Scheme 2. Mesomeric structures for the metallafuran moieties on [1a]⁺, [1b]⁺, [2a]⁺ and [2b]⁺

Proposed Mechanism

Scheme 3. One plausible *cis*-[Os(LAL)₂Cl₂]-allenol reaction mechanism

**Conclusion**

Unlike the conventional Os(II)-induced allene activation, allenol with (CH(R)(OH)) moieties can form metallafurans with Osmium complex through β -hydride elimination. This also perform a new strategy for the synthesis of metallafurans.

Reference: *Organometallics* **2022**, *41*, 1931–1941.

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