

Reaction of *N*-Sulfonyl-1,2,3-Triazole with β -Diketone

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Imino carbenoids **I** derived from *N*-sulfonyl-1,2,3-triazoles **1** can undergo useful tandem reactions, because they have a nucleophilic imino group in addition to an electrophilic carbenoid moiety.^{1,2} In the present study, we investigated that Rh(II)-catalyzed reaction of *N*-mesyl-1,2,3-triazole (**1a**) with cyclic β -diketones **2**.

In the case of the 2 mol% Rh₂(piv)₄-catalyzed reactions of **1a** with 3 equiv. of **2a–c**, enaminones **3a** were formed as a major product (Scheme 1, Table 1, Entries 1, 2, and 4). In addition, 2,3-fused pyrrole **4ac** was obtained in moderate yield along with **3a** by the 2 mol% Rh(II)-catalyzed reactions of **1a** with 3 equiv. of dimedone (**2c**) (Table 1, Entries 3, and 4).

However, regardless of the rhodium catalyst used, 2 mol% Rh(II)-catalyzed reactions of **1a** with 5-phenyl-1,3-cyclohexanedione (**2d**) gave triazole skeleton-remained products **5ad** and **6ad**, which were not imino carbenoid **1a**-participated products, as a major product (Scheme 2 and Table 2).

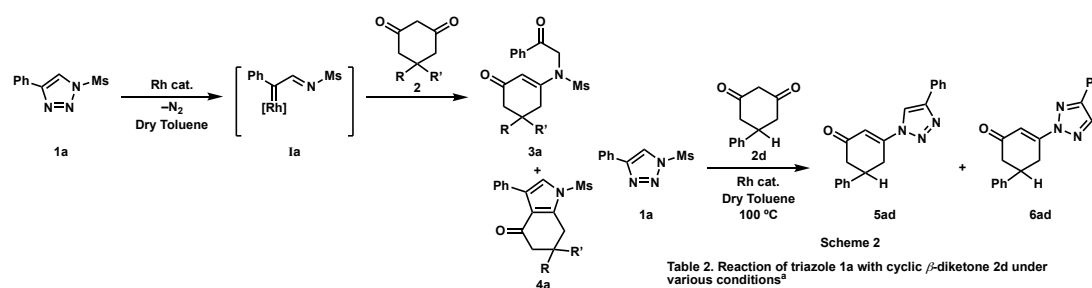


Table 1. Reaction of triazole **1a** with cyclic β -diketones **2** under various conditions^a

Entry	2	R	R'	Rh cat.	Temp.	Yield ^b (%)	
						3a	4a
1	2a	H	H	Rh ₂ (piv) ₄	100 °C	42	–
2	2b	CH ₃	H	Rh ₂ (piv) ₄	100 °C	58	–
3	2c	CH ₃	CH ₃	Rh ₂ (hex) ₄	100 °C	23	22
4	2c	CH ₃	CH ₃	Rh ₂ (piv) ₄	100 °C	33	12

^aConditions: **1** (1.0 mmol), **2** (3.0 mmol), 4 Å MS (400 mg), and Rh(II) catalyst (2 mol%) were combined in solvent (5 ml) and stirred under an argon atmosphere. ^bIsolated yield.

Table 2. Reaction of triazole **1a** with cyclic β -diketone **2d** under various conditions^a

Entry	Rh cat.	Equiv. of 2d	Yield ^b (%)	
			5ad	6ad
1	Rh ₂ (piv) ₄	3	48	–
2	Rh ₂ (hex) ₄	3	45	37
3	Rh ₂ (piv) ₄	1	37	12
4	Rh ₂ (hex) ₄	1	37	22
5	Rh ₂ (esp) ₄	3	48	27

^aConditions: **1** (1.0 mmol), **2d** (4 Å MS (400 mg), and Rh(II) catalyst (2 mol%) were combined in dry toluene (5 ml) and stirred under an argon atmosphere.

^bIsolated yield.

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