

Reaction of *N*-Sulfonyl-1,2,3-Triazoles with β -Diketones

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Keywords: *N*-Sulfonyl-1,2,3-Triazole; Imino carbenoid; Rhodium carboxylate; Substituent effect

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-triazoles (**1a**) with cyclic β -diketones **2**.

Enaminones **3a** were formed as a major product by the 2 mol% Rh₂(piv)₄-catalyzed reactions of **1a** with 3 equiv. of **2a–c** (Table 1, Entries 1, 2, and 4). On the other hand, 2,3-fused pyrrole **4ac** were obtained in moderate yield by the 2 mol% Rh₂(hex)₄-catalyzed reaction of **1a** with 3 equiv. of dimedone (**2c**) (Table 1, Entry 3). The 2 mol% Rh₂(piv)₄-catalyzed reaction of **1a** with 3 equiv. 1,3-cyclopentanedione (**2e**), or 3 equiv. of 5-phenyl-1,3-cyclohexanedione (**2d**) gave triazole skeleton-remained products **5ae** and **5'ad**, respectively (Table 1, Entries 5, and 6). In addition, triazole skeleton-remained product was confirmed as a major product of the 2 mol% Rh₂(piv)₄-catalyzed reactions of **1a** with 1 equiv. of **2d**. However, triazole skeleton-remained product was not confirmed in the 5 mol% Rh₂(piv)₄-catalyzed reactions of **1a** with 1 equiv. of **2d**.

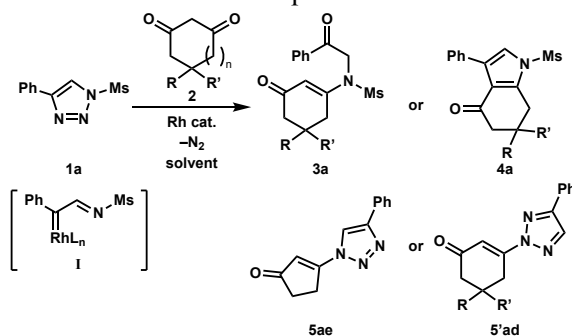


Table 1. Reaction of triazole **1a** with cyclic β -diketones **2** under various conditions^a

Entry	2	R	R'	n	Rh cat.	Solvent	Temp.	Yield ^b (%)			
								3a	4a	5a	5'a
1	2a	H	H	1	Rh ₂ (piv) ₄	Toluene	100 °C	42	–	–	–
2	2b	CH ₃	H	1	Rh ₂ (piv) ₄	Toluene	100 °C	58	–	–	–
3	2c	CH ₃	CH ₃	1	Rh ₂ (hex) ₄	Toluene	100 °C	23	22	–	–
4	2c	CH ₃	CH ₃	1	Rh ₂ (piv) ₄	Toluene	100 °C	33	12	–	–
5	2d	Ph	H	1	Rh ₂ (piv) ₄	Toluene	100 °C	–	–	–	49
6	2e	H	H	0	Rh ₂ (piv) ₄	1,2-DCE	reflux	–	–	33	–

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

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