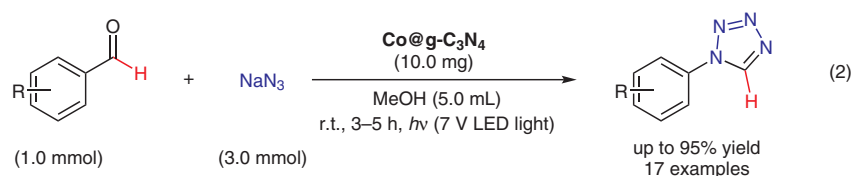
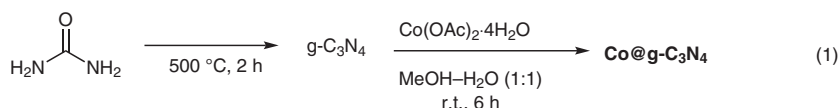


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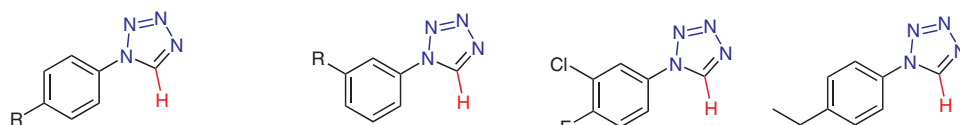
Visible-Light Driven Regioselective Synthesis of 1*H*-Tetrazoles from Aldehydes through Isocyanide-Based [3+2] Cycloaddition

*Green Chem.* **2018**, *20*, 3783–3789.

# Cobalt-Catalyzed Regioselective Photochemical Synthesis of 1*H*-Tetrazoles



Results:



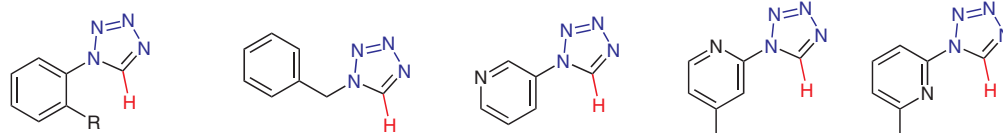
R = Cl, 92% yield  
R = Br, 93% yield  
R = NO<sub>2</sub>, 95% yield

R = Me, 88% yield  
R = OMe, 87% yield  
R = Ac, 90% yield  
R = H, 89% yield

R = Cl, 89% yield  
R = Me, 87% yield

87% yield

85% yield



R = Cl, 90% yield  
R = Me, 88% yield

89% yield

86% yield

85% yield

84% yield

**Significance:** A cobalt-doped polymeric graphitic carbon nitride catalyst (Co@g-C<sub>3</sub>N<sub>4</sub>) was prepared by calcination of urea followed by treatment with Co(OAc)<sub>2</sub>·4H<sub>2</sub>O in aqueous methanol (eq. 1). Co@g-C<sub>3</sub>N<sub>4</sub> catalyzed the reaction of aldehydes with sodium azide under visible-light irradiation and air to give the corresponding 5-substituted 1*H*-tetrazoles in up to 95% yield (eq. 2). The authors propose an isocyanide intermediate, formed through a Co@g-C<sub>3</sub>N<sub>4</sub>-induced photocatalytic 1,2-phenyl migration from C to N.

**Comment:** Co@g-C<sub>3</sub>N<sub>4</sub> was characterized by means of SEM, XPS, XRD, FTIR, UV-Vis, EDX, TEM, and photoluminescence analyses. In the reaction of 4-chlorobenzaldehyde with sodium azide, the catalyst was recovered by filtration and reused four times without significant loss of its catalytic activity.

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Synfacts 2018, 14(11), 1199 Published online: 18.10.2018  
DOI: 10.1055/s-0037-1611269; Reg-No.: Y11918SF

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Category

Polymer-Supported Synthesis

Key words

cobalt catalysis

photocatalysis

tetrazoles

graphitic carbon nitride

aldehydes

cycloaddition

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