

N-Alkylimidazole-Decorated Dendritic Catalysts for Baylis–Hillman Reaction

Category

Polymer-Supported Synthesis

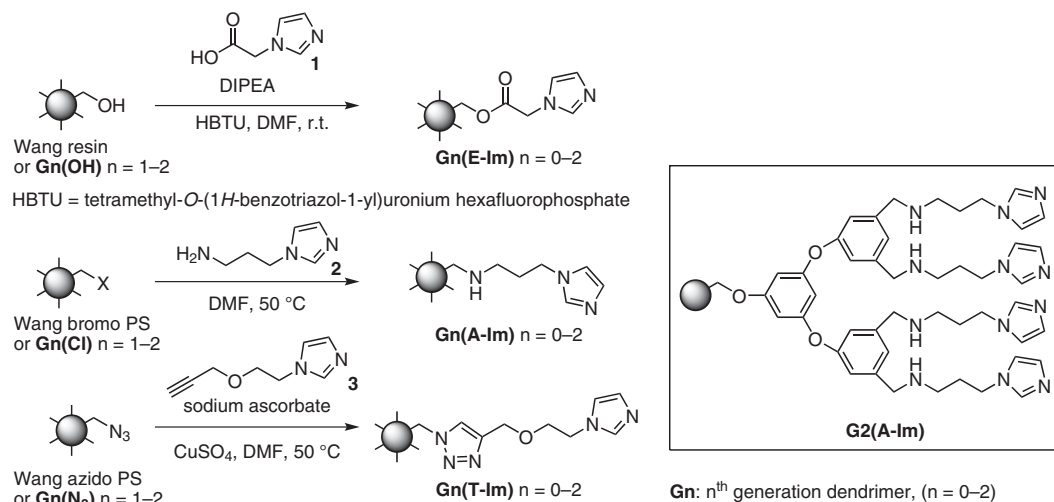
Key words

Baylis–Hillman reaction

N-alkylated imidazoles

dendrons

heterogeneous catalysis

SYNFACT
of the month

Catalyst		Yield (%)	Solvent	Time (h)
G0(E-Im)	DMF	11%	DMF	48 h
	DMF–H ₂ O (9:1)	31%	DMF–H ₂ O (9:1)	48 h
	DMF–H ₂ O (1:1)	97%	DMF–H ₂ O (1:1)	6 h
G1(E-Im)	DMF–H ₂ O (9:1)	43%	DMF–H ₂ O (9:1)	48 h
G2(E-Im)	DMF–H ₂ O (9:1)	59%	DMF–H ₂ O (9:1)	48 h
G0(T-Im)	DMF	6%	DMF	22 h
	DMF–H ₂ O (9:1)	58%	DMF–H ₂ O (9:1)	22 h
	DMF–H ₂ O (1:1)	100%	DMF–H ₂ O (1:1)	22 h
G1(T-Im)	DMF–H ₂ O (9:1)	74%	DMF–H ₂ O (9:1)	22 h
G2(T-Im)	DMF–H ₂ O (9:1)	100%	DMF–H ₂ O (9:1)	22 h
G0(A-Im)	DMF–H ₂ O (9:1)	34%	DMF–H ₂ O (9:1)	4 h
	DMF–H ₂ O (8:2)	69%	DMF–H ₂ O (8:2)	6 h
	DMF–H ₂ O (7:3)	38%	DMF–H ₂ O (7:3)	1.5 h
G1(A-Im)	DMF–H ₂ O (9:1)	47%	DMF–H ₂ O (9:1)	4 h
	DMF–H ₂ O (9:1)	62%	DMF–H ₂ O (9:1)	1.5 h
	THF–H ₂ O (9:1)	95%	THF–H ₂ O (9:1)	6 h
G2(A-Im)	DMF–H ₂ O (9:1)	91%	DMF–H ₂ O (9:1)	4 h
	DMF–H ₂ O (7:3)	95%	DMF–H ₂ O (7:3)	1.5 h
	THF–H ₂ O (9:1)	100%	THF–H ₂ O (9:1)	6 h

Significance: Polymer-supported dendritic catalysts [**Gn(E-Im)**, **Gn(A-Im)**, **Gn(T-Im)**] were prepared from Wang resins and *N*-alkylated imidazoles (**1–3**), and applied to the Baylis–Hillman reaction. Thus, the Baylis–Hillman reaction of methyl vinyl ketone and 4-nitrobenzaldehyde was performed with the catalytic resin **G2(A-Im)** (0.1 mmol of *N*-alkylated imidazole units) in DMF–H₂O (9:1, v/v) at room temperature for 4 h to afford adduct **4** in 91% yield.

Comment: The addition of water improved the catalytic activity in the Baylis–Hillman reaction. The second-generation catalysts [**G2(E-Im)**, **G2(T-Im)**, **G2(A-Im)**] exhibited higher catalytic activity than their non-dendritic counterparts [**G0(E-Im)**, **G0(T-Im)**, **G0(A-Im)**].