

The role of PMA in enhancing the surface acidity and catalytic activity of bimetallic Cr-Mg-MOF and its applications for synthesis of coumarin and dihydropyrimidinone derivatives

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Table 1S†: Comparison study for synthesis of 7-hydroxy-4-methylcoumarin in presence of Cr-Mg-MOF and wt. % PMA/ Cr-Mg-MOF with other catalysts reported in the literature

Entry	Catalyst	Conditions	Yield (%)	Ref.
1	Without catalyst	Free solvent, Reflux, 120° C, 6hr	Nil	Recent work
	Cr-Mg-MOF	Free solvent, Reflux, 120° C, 2hr	Traces	Recent work
2	75 wt.% PMA/ Cr-Mg-MOF	Free solvent, Reflux, 120° C, 2hr	68.7 %	Recent work
3	HKUST-1	Free solvent, Reflux, 120° C, 2hr	2.0 %	[48]
4	Sulfamic acid@ HKUST-1	Free solvent, Reflux, 120° C, 2hr	59.0%	[48]
5	MIL-101 (Cr)	Free solvent, Reflux, 120° C, 2hr	Traces	[31]
6	Amberlyst-15	Free solvent, 150° C, 2hr	72.0%	[49]
7	W/ZrO ₂	Toluene, 150° C, 6hr	80.0%	[50]

Table 2S†: Comparison study for synthesis of 7-hydroxy-4-methylcoumarin in presence of Cr-Mg-MOF and wt. % PMA/ Cr-Mg-MOF with other catalysts reported in the literature

Entry	Catalyst	Conditions	Yield (%)	Ref.
1	Without catalyst	Free solvent, Reflux, 100° C, 6hr	Traces	Recent work
	Cr-Mg-MOF	Free solvent, Reflux, 100° C, 1.5hr	21.2 %	Recent work
2	75 wt.% PMA/ Cr-Mg-MOF	Free solvent, Reflux, 100° C, 1.5hr	96.1 %	Recent work
3	HKUST-1	Free solvent, Reflux, 80° C, 2hr	35.0 %	[48]
4	Sulfamic acid@ HKUST-1	Free solvent, Reflux, 80° C, 2hr	89.0%	[48]
5	cellulose sulfuric acid	CH ₂ Cl ₂	68.0 %	[56]
6	silica sulfuric acid	Solvent, 100° C	91.0 %	[56]
7	AlCl ₃	Solvent free, 8–10hr	40.0 %	[57]