

Supporting Information

Fabrication of Bimetal CuFe₂O₄ Oxide Redox-Active Nanocatalyst for Oxidation of Pinene to Renewable Aroma Oxygenates

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Table S1. Summary of the XRD and Rietveld refinement of spinel CuFe₂O₄ catalysts.

Catalyst Name	^a Phases	^b Phase Qty (%)	2 θ	(hkl)	^c d (hkl) (Å)	^d L (Å)	^e Strain
Copper oxide	CuO	100	35.5°	002	2.54	102	1.24
Iron oxide	Fe ₂ O ₃	100	35.6°	133	2.52	153	0.823
CuFe-1 (commercial)	Cu Fe ₂ O ₄	100	35.6°	113	2.50	137.3	0.01
CuFe-2 (1EG:1H ₂ O)	CuFe ₂ O ₄	98.2	35.9°	111	2.49	39.1	3.2
	CuO	1.8	35.5°	122	2.53	177	0.31
CuFe-3 (4EG:1H ₂ O)	Cu Fe ₂ O ₄	98.2	35.9°	111	2.49	38.1	3.28
	CuO	1.8	35.5°	002	2.53	147	0.86
CuFe-4 (1EG:4H ₂ O)	CuFe ₂ O ₄	94	35.98°	111	2.49	39.7	3.14
	CuO	1.7	38.9°	116	2.31	137	0.85
	Cu(OH) ₂	4.3	35.5°	002	2.53	147	0.86

^{c,d,e} Estimated from XRD results using the Bragg's and Scherrer's equation, whereas ^{a,b} Rietveld analysis. Tenorite (CuO)—monoclinic, hematite (Fe₂O₃)—cubic; copper ferrites (CuFe₂O₄)—tetragonal.

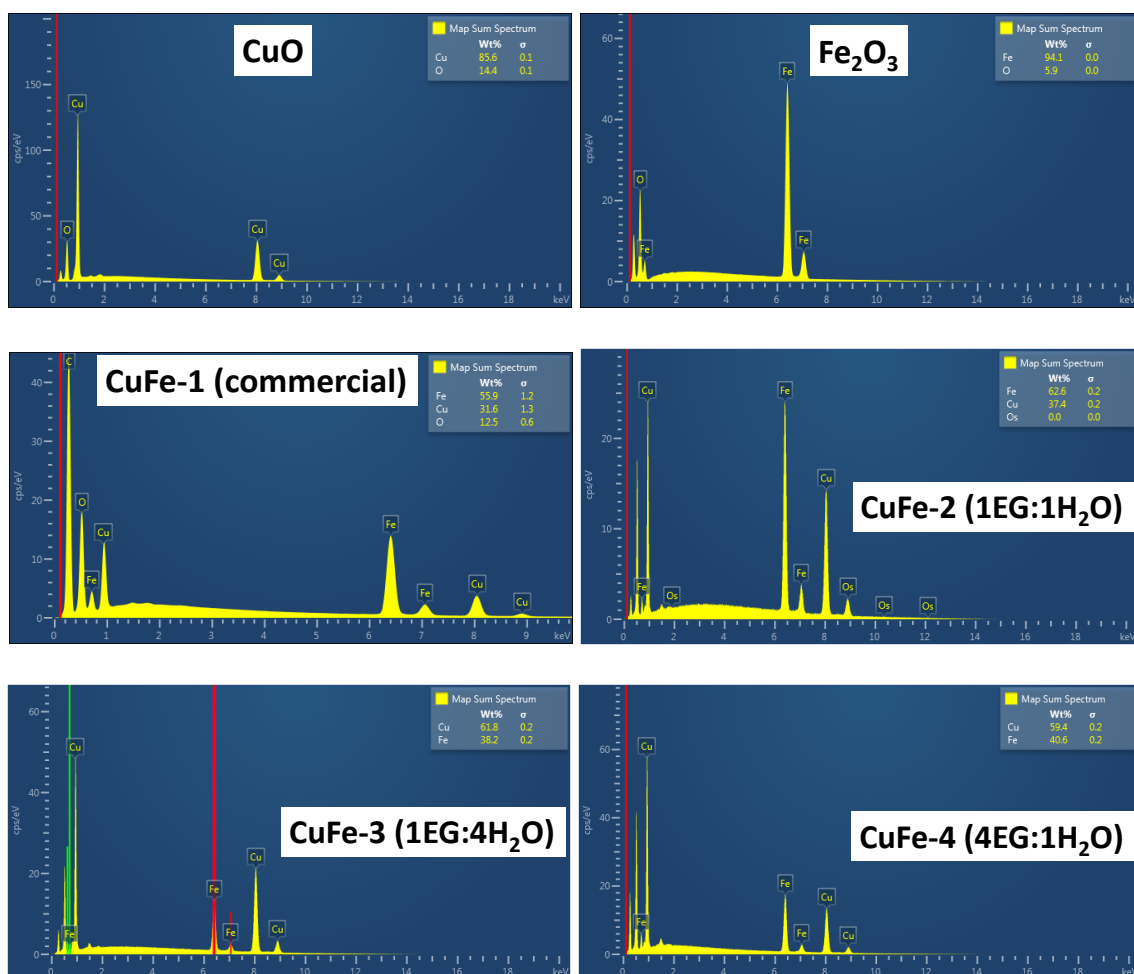


Figure S1. EDX spectra of the copper oxide, iron oxide and copper ferrites catalyst as solvent ratio changes.