Supplementary Material (ESI) for Journal of Materials Chemistry
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Synthesis of highly thermostable copper-nickel nanoparticles confined in the channels of ordered mesoporous SBA-15 silica

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Electronic Supplementary Information (ESI)

Experimental

Physico-chemical characterization

XPS analyses for calcined and in-situ reduced CuNi/SBA-15/*500* sample (30 mL·min^{-1}, 5 vol. % H_2 in Ar at 350 ^{o}C for 5 h) were performed with a SSI X-probe (SSX-100/206) spectrometer from Surface Science Instrument. The analysis chamber was operated under ultrahigh vacuum with a pressure close to 5.10^{-9} Torr. X-rays were produced by a monochromatized aluminium anode working with monochromatic Al-Kα (1486.6 eV) radiation (10 kV, 22 mA). For the measurements, the binding energy (BE) values were referred to the C 1s photopeak at 284.8 eV. The surface Cu/(Cu+Ni) atomic ratio was calculated by correcting the intensity with theoretical sensitivity factors based on Scofield cross sections. Peak decomposition was performed using 85% Gaussian and 15% Lorentzian types and a Shirley non-linear sigmoid-type baseline

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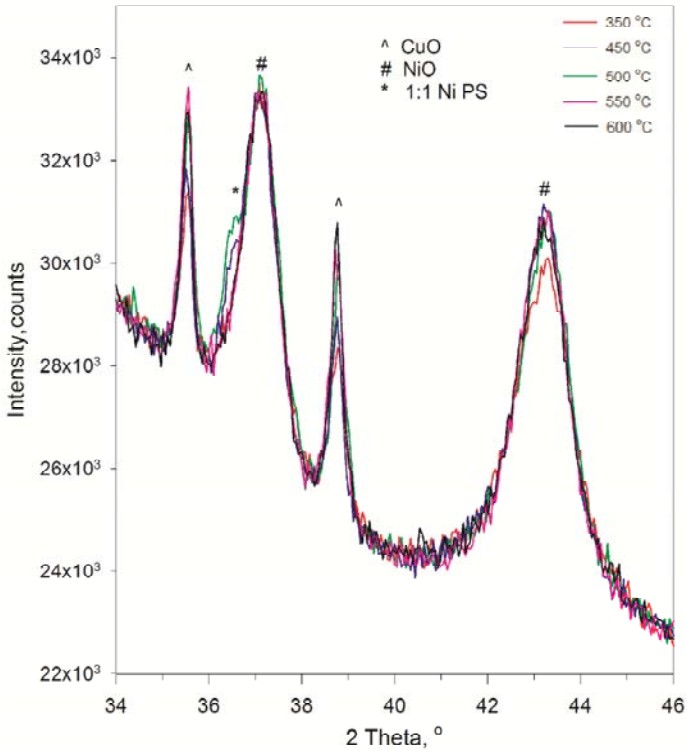

Fig. S1. Normalised powder HAXRD patterns of CuNi/SBA-15 calcined at different temperatures.

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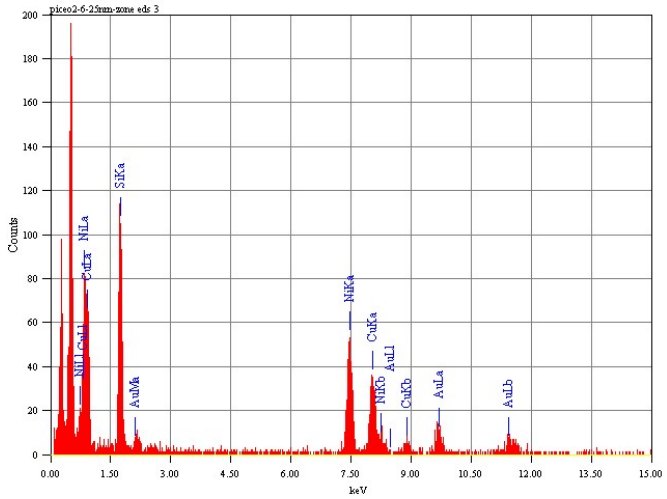
a



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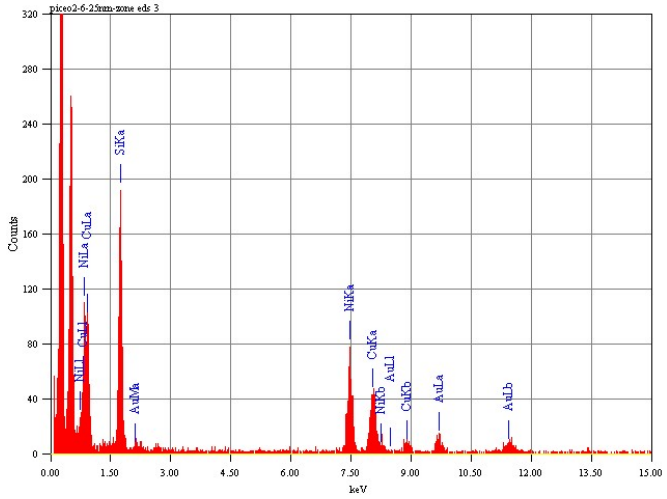

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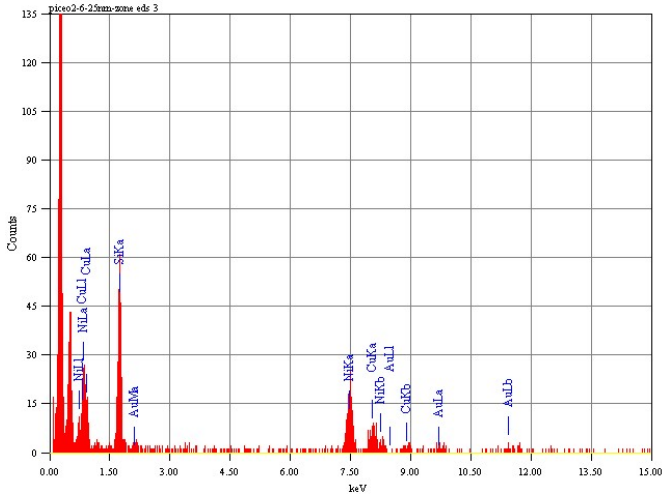

Fig. S2. Typical EDX spectra for CuNi/SBA-15 calcined at 350 ^{o}C (a), 500 ^{o}C (b) and 600 ^{o}C (c).

Table S1. XPS binding energies obtained from curve-fitted values of experimental spectra for the sample CuNi/SBA-15/*500* before and after reduction treatment at 350 °C

Sample CuNi/SBA-15/*500*	Binding energy, eV						Cu/(Cu+Ni) atomic ratio
	Cu $2p_{3/2}$		Ni $2p_{3/2}$		O *1s*	Si *2p*	
	Cu^{2+}	Cu^0	Ni^{2+}	Ni^0			
Before reduction	933.4 (*916.9*[a])	-	856.0	-	533.1	103.6	0.65
After reduction	-	932.6 (*918.4*[a])	856.1	852.6	533.1	103.7	0.61

[a]in brackets are the kinetic energies (KE) of the Auger Cu LMM transitions determined by Auger Electron Spectroscopy

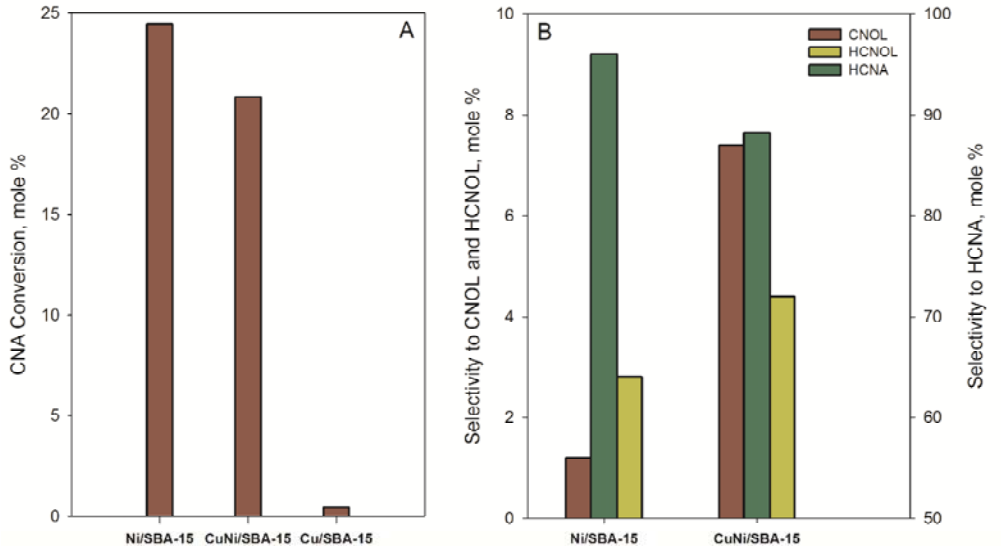

Fig. S3. Catalytic activity (A) and selectivity (B) of bimetallic CuNi/SBA-15/*500* as compared to monometallic Ni/SBA-15/*500* and Cu/SBA-15/*500*

(Reaction conditions: reduction temperature of 350 °C; 1ml trans-cinnamaldehyde; 25 ml PC as solvent; 0.265 g of catalyst; hydrogen flow of 1 $L.h^{-1}$; reaction temperature of 150 °C, agitation speed of 900 rpm. CNA conversions are reported after 60 min. of reaction. Selectivities are reported at isoconversion of ~ 20 mole % CNA)