Supplementary Information

Gold Supported on Strontium Surface-Enriched $CoFe_2O_4$ Nanoparticles: a Strategy for the Selective Oxidation of Benzyl Alcohol

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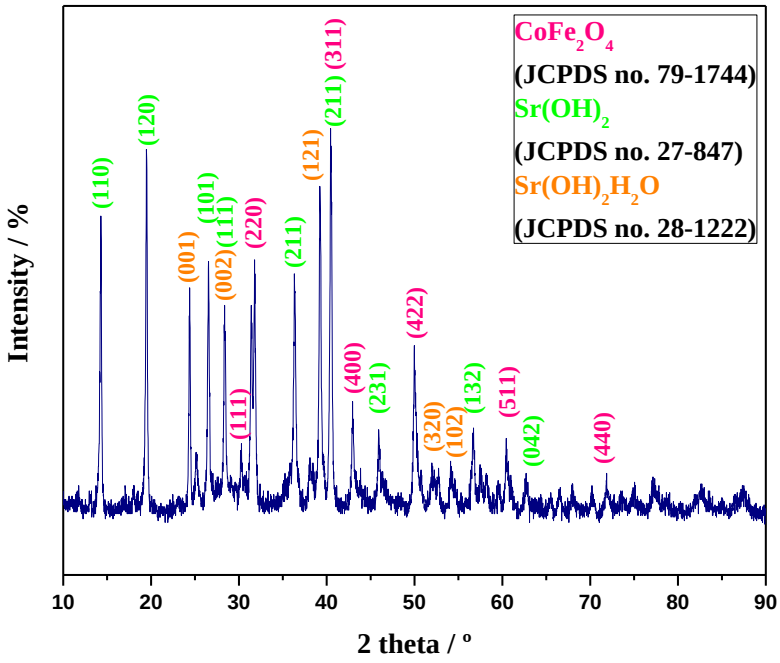

Figure S1. X-ray powder diffraction patterns for $Au/Sr(OH)_2/CoFe_2O_4$.

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Table S1. Lattice parameters, unit cell volume, atomic positions obtained from Rietveld refinements of $Au/Sr(OH)_2/CoFe_2O_4$ catalyst

Atom	Wyckoff	Site	x	y	z
Co1	8a	–43m.	0	0	0
Fe1	8a	–43m.	0	0	0
Co2	16d	–3m.	5/8	5/8	5/8
Fe2	16d	–3m.	5/8	5/8	5/8
O1	32e	3m.	0.37601	0.37601	0.37601
[Phase 1: $CoFe_2O_4$; Fd-3m (227) – Cubic (a = 8.3860(3) Å; V = 589.76(5) Å^3; Z = 8)]					
Atom	Wyckoff	Site	x	y	z
Sr1	4c	m.	0.16119(10)	0.095839(15)	0.25000
O1	4c	m.	0.3952(9)	0.3442(15)	0.25000
O2	4c	m.	0.3693(9)	–0.1349(14)	0.25000
H1	4c	m.	0.4300	0.20000	0.25000
H2	4c	m.	0.4700	–0.11000	0.25000
[Phase 2: $Sr(OH)_2$; Pnam (62) – Orthorhombic (a = 9.8888(5) Å, b = 6.1201(6) Å, c = 3.9184(3) Å; V = 237.16(4) Å^3; Z = 4; a/b = 1.6157, b/c = 1.5671, c/a = 0.3963)]					
Atom	Wyckoff	Site	x	y	z
Sr1	2a	m.	0	0.3722(5)	1/4
O1	2a	m.	0	0.7853(6)	0.3764(8)
O2	2b	m.	1/2	0.0657(7)	0.2445(9)
O3	2b	m.	1/2	0.5628(6)	0.0349(7)
H1	4c	1	0.208 (2)	0.8768(8)	0.0333(1)
H2	2b	m.	1/2	0.035(2)	0.107(2)
H3	2b	m.	1/2	0.701(2)	0.090(2)
[Phase 3: $Sr(OH)_2H_2O$; Pmc21 (26) – Orthorhombic (a = 4.7346(3) Å, b = 8.0440 Å, c = 8.7155 (5) Å; V = 331.93(3) Å^3; Z = 2; a/b = 0.5886, b/c = 0.9230, c/a = 1.8408)]					

$Au/Sr(OH)_2/CoFe_2O_4$ catalyst, Rp = 15.5%; Rexp = 7.75%, Rwp = 11.16%, χ^2 = 2.0736 and GoF = 1.440.

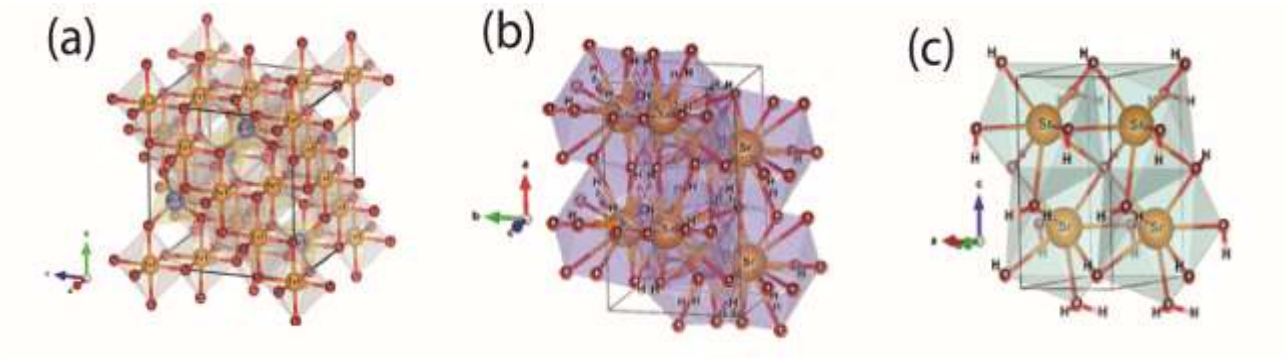

Figure S2. Schematic illustration of a crystalline representation of (a) cubic $CoFe_2O_4$; (b) orthorhombic $Sr(OH)_2$ and (c) orthorhombic $Sr(OH)_2H_2O$ unit cells.

Table S2. Chemical analysis and surface properties measured by N_2 physisorption of the catalyst

Catalyst	Au content / %	Surface area / (m^2 g^{-1})	Pore diameter / Å	Total pore volume / (cm^3 g^{-1})
$Sr(OH)_2/CoFe_2O_4$	–	24.75	64.02	0.033
$Au/Sr(OH)_2/CoFe_2O_4$	2.0	9.22	89.37	0.018

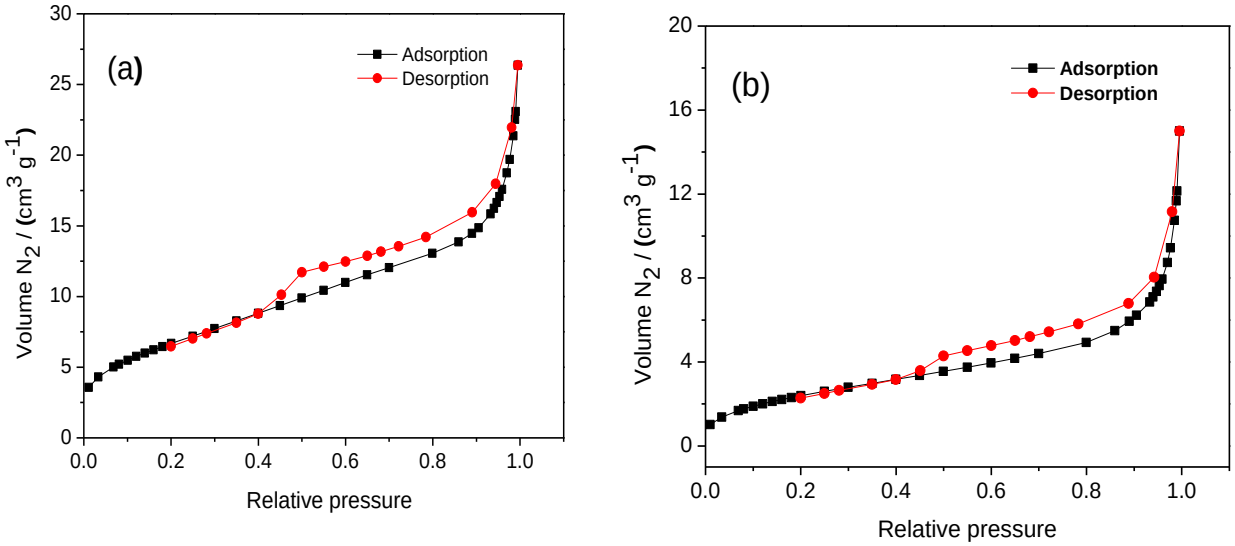

Figure S3. N_2 adsorption/desorption isotherms (at room temperature) for the catalysts: (a) $Sr(OH)_2/CoFe_2O_4$ and (b) $Au/Sr(OH)_2/CoFe_2O_4$.

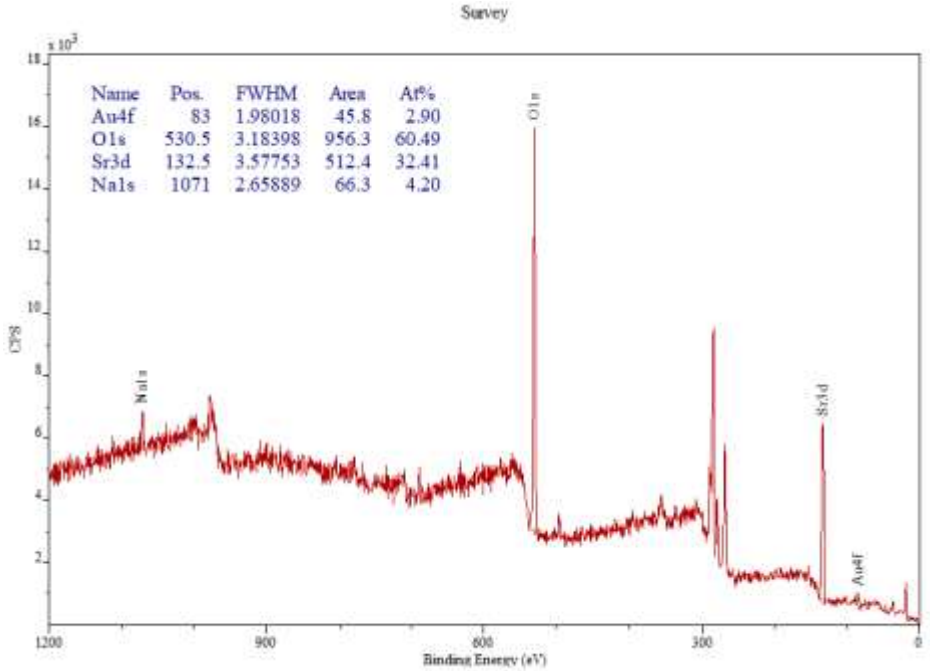

Figure S4. XPS pattern of the $Au/Sr(OH)_2/CoFe_2O_4$ catalyst considering the presence of Au, O, Sr and Na for the at.% calculation.