Supporting Materials: The Preparation and Characterization of Co–Ni Nanoparticles and the Testing of a Heterogenized Co–Ni/Alumina Catalyst for CO Hydrogenation
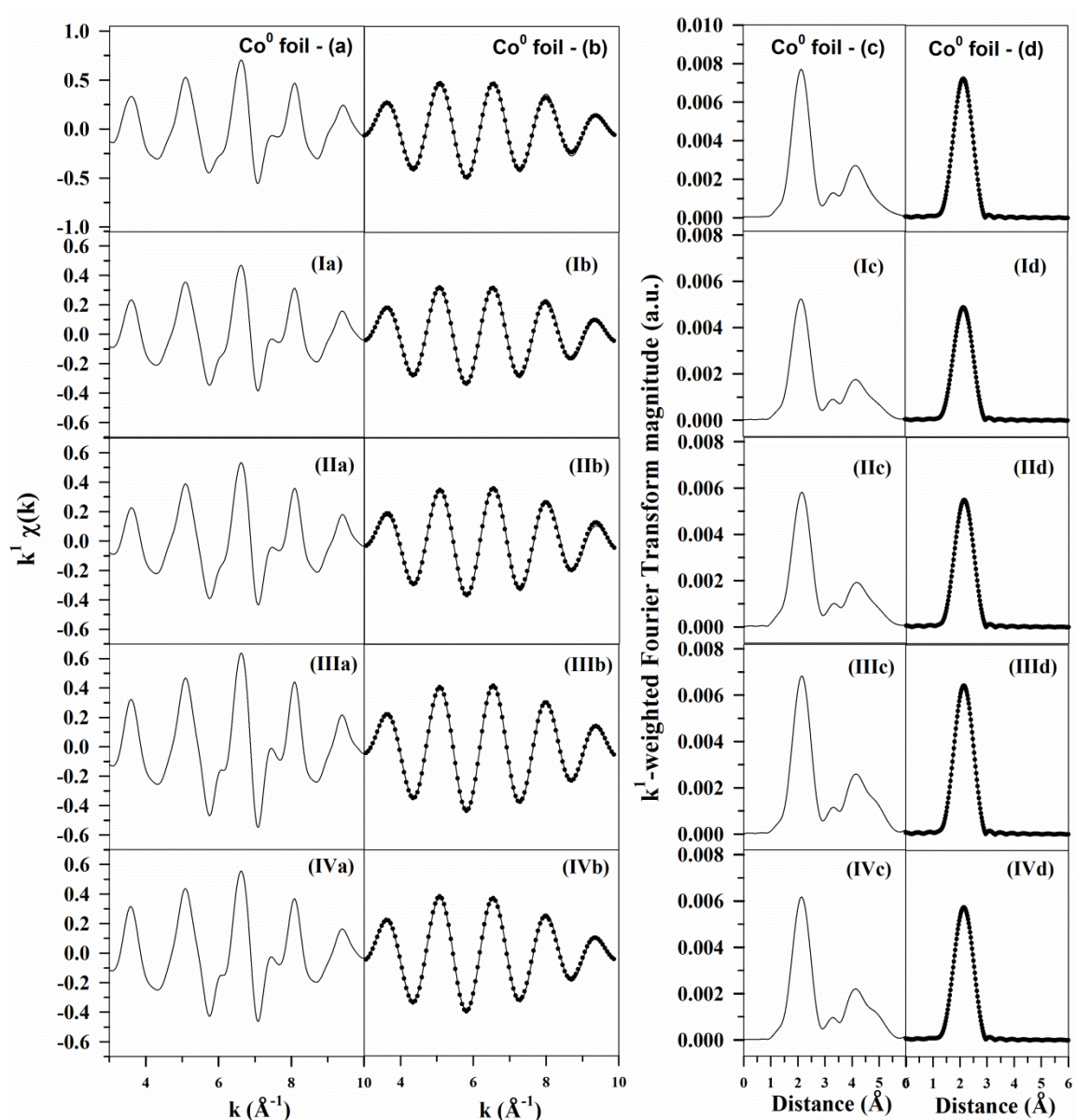

Figure S1: EXAFS fittings for Co K-edge data, including (a) raw k1-weighted $\chi(k)$ data, (b) (solid line) filtered k^1-weighted $\chi(k)$ data and (filled circles) results of the fittings, and (c) (solid line) raw k1-weighted Fourier transform magnitude and (d) (solid line) filtered k^1-weighted Fourier transform magnitude and (filled circles) results of the fittings for Co^0 foil, (I) Sample #1, (II) Sample #2, (III) Sample #3, and (IV) Sample #4 (fitting #2).

Figure S2: EXAFS fittings for Ni K-edge data, including (a) raw k^1-weighted χ(k) data, (b) (solid line) filtered k^1-weighted χ(k) data and (filled circles) results of the fittings, and (c) (solid line) raw k^1-weighted Fourier transform magnitude and (d) (solid line) filtered k^1-weighted Fourier transform magnitude and (filled circles) results of the fittings for (I) Sample #1, (II) Sample #2, (III) Sample #3, and (IV) Sample #4 (fitting #2).

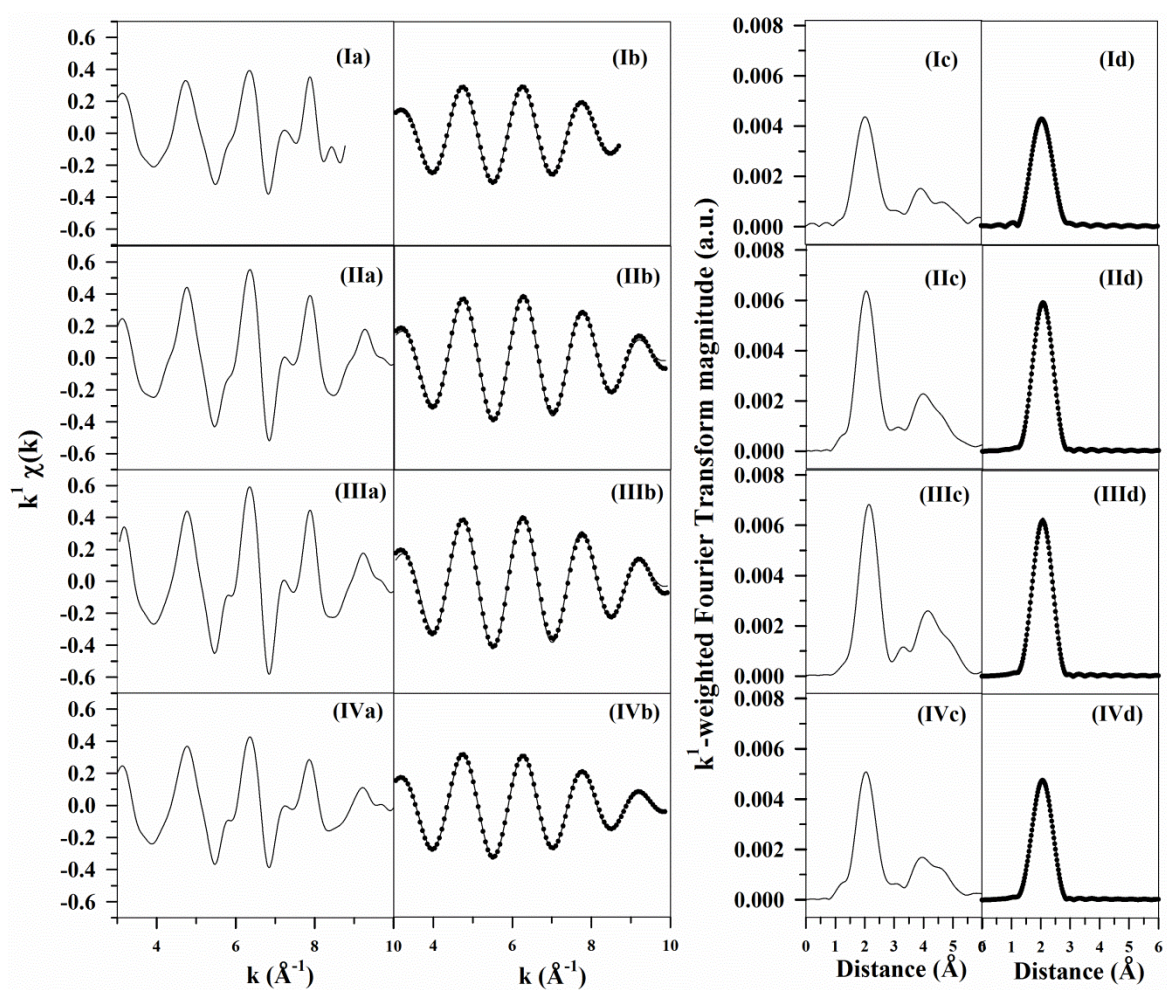**Table S1**: Results of EXAFS fitting* for data acquired near the Co and Ni K edges for catalysts following TPR-EXAFS after cooling. The fitting ranges were Δk = 3 – 10 Å^{-1} and ΔR = 1.2 – 2.8 Å. *S_0^2 set to 0.90. ** Fixed parameter.

Sample Description	N Co-Co metal	R Co-Co (Å) metal	N Co-Ni metal	R Co-Ni (Å) metal	N Ni-Ni metal	R Ni-Ni (Å) metal	N Ni-Co metal	R Ni-Co (Å) Metal	e_0 (eV)	σ^2 (Å^2)	r-factor
Co^0 foil	12**	2.495 (0.0055)	-	-	-	-	-	-	7.019 (0.574)	0.00744 (0.00038)	0.0037
Catalyst 1	8.2 (2.9)	2.501 (0.0061)	0.001 (3.5)	2.493 (0.0061)	0.001 (3.5)	2.484 (0.0061)	7.5 (2.5)	2.493 (0.0061)	7.522 (0.8760) -6.066 (0.7450)	0.00746 (0.001316)	0.0064
Catalyst 2	7.6 (4.2)	2.496 (0.0060)	0.68 (5.5)	2.487 (0.0060)	0.73 (5.9)	2.479 (0.0060)	8.1 (4.2)	2.487 (0.0060)	7.079 (0.8044) -6.532 (0.6600)	0.00615 (0.001358)	0.0058
Catalyst 3	9.0 (3.4)	2.494 (0.0034)	0.74 (4.2)	2.486 (0.0034)	0.71 (4.1)	2.477 (0.0034)	8.7 (3.0)	2.486 (0.0034)	7.145 (0.6623) -6.564 (0.7613)	0.00636 (0.000816)	0.0058
Catalyst 4 (fitting #1)	9.8 (9.7)	2.502 (0.0070)	1.4 (12.0)	2.493 (0.0070)	1.2 (10.2)	2.485 (0.0070)	8.0 (7.2)	2.493 (0.0070)	8.131 (1.000) -6.210 (0.845)	0.00894 (0.00142)	0.0052
Catalyst 4 (fitting #2)	9.5 (0.5)	2.497 (0.0037)	1.0 (0.1)	2.488 (0.0037)	0.8 (0.1)	2.480 (0.0037)	7.9 (0.3)	2.488 (0.0037)	6.978 (0.422) -6.542 (0.392)	0.00840 (0.00058)	0.0023