

Supplementary material

Synergy effects of cobalt oxides on Ni/Co-embedded Al₂O₃ for hydrogen-rich syngas production by steam reforming of propane

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Supplementary **Table S1** represents the catalytic activities of the CA supports with some reference materials.

Supplementary **Figure S1** represents the textural properties of the fresh NCA catalysts measured by N₂ adsorption-desorption analysis of the (A) adsorption-desorption isotherms and (B) pore size distributions .

Supplementary **Figure S2** represents the wide-angle X-ray diffraction (XRD) patterns of the (A) reduced and (B) used NCA catalysts.

Table S1. Catalytic activities of the CA supports with some reference materials^a

Notation	Conversion of propane (mol %) ^a		
	550 °C	650 °C	750 °C
CA(0.5)	57.4	79.6	93.3
CA(1)	57.2	86.9	98.4
CA(2)	45.8	77.7	96.1
CA(3)	-	2.6	51.8
CA(4)	-	-	34.2
CoAl ₂ O ₄	-	4.6	28.4
NCA(1)	100	100	100
Ni/Al ₂ O ₃	42.8	65.2	93.4

^aPreliminary measurements of the catalytic activity on the CA supports with some reference catalysts such as CoAl₂O₄ solid-solution and impregnated Ni/Al₂O₃ for steam reforming of C₃H₈ (SRP) with time on stream (h) were performed at the reaction conditions of T = 550 – 650 – 750 °C, P = 0.1 MPa and SV = 100,800 L/(kg_{cat}·h) by using a feed gas composition of C₃H₈/N₂/H₂O = 1:4:9.

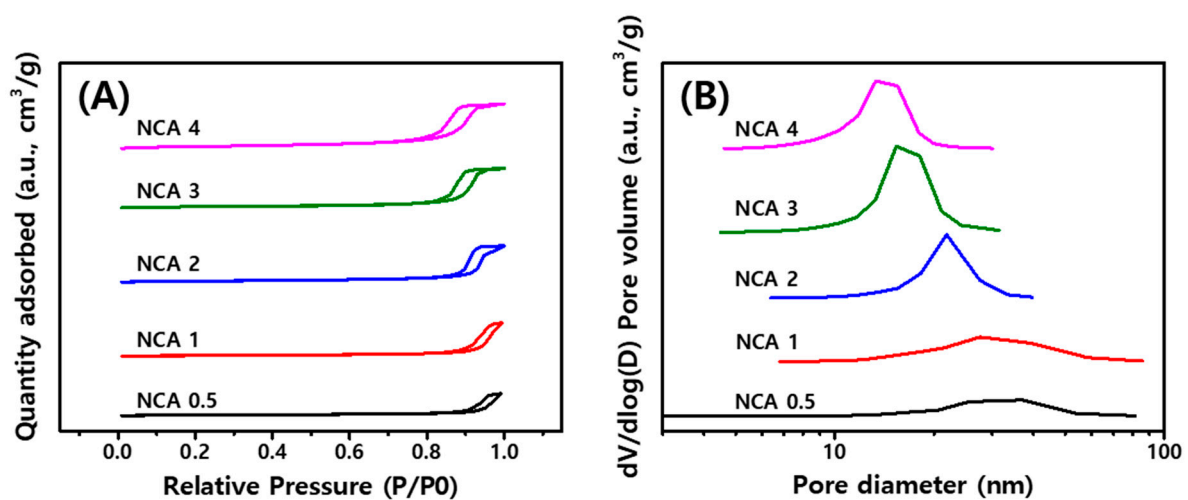


Figure S1. Textural properties of the fresh NCA catalysts measured by N₂ adsorption-desorption analysis of the (A) adsorption-desorption isotherms and (B) pore size distributions

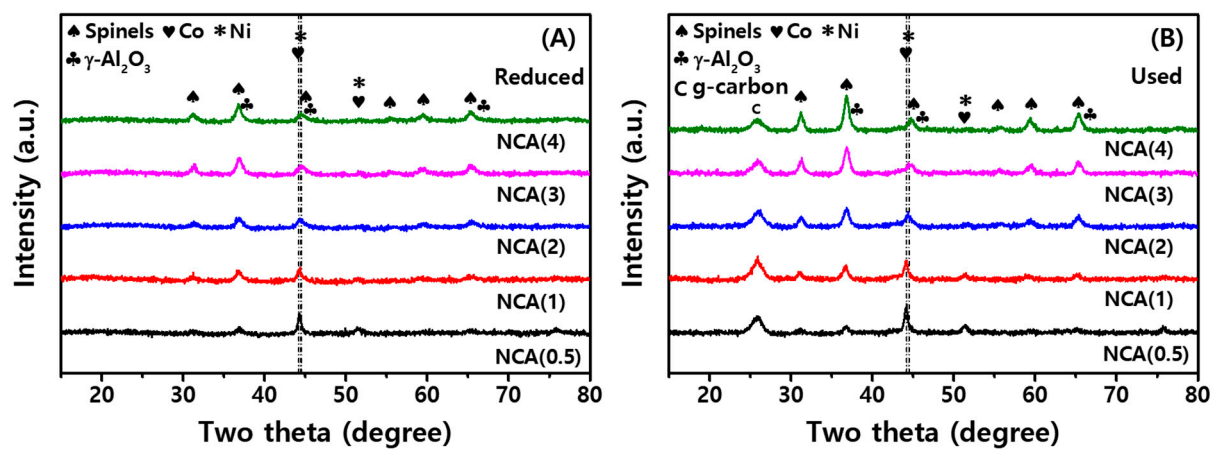


Figure S2. Wide-angle X-ray diffraction (XRD) patterns of the (A) reduced and (B) used NCA catalysts