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Support information

Ru nanoparticles on Y_2O_3 with enhanced metal-support interaction for efficient ammonia synthesis

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Table S1 Catalyst activities for ammonia synthesis over various catalysts operated under similar conditions.

Catalysts	Ru loading (wt%)	Temperature (ºC)	Pressure (MPa)	WHSV (mL g_{cat}^{-1} h^{-1})	NH_3 synthesis rate (μmol g_{cat}^{-1} h^{-1})	Ref.
Ru/Y_2O_3-p	5.0	400	1.0	24000	21120	This work
Ru/Y_2O_3-p	5.0	400	1.0	18000	18120	This work
Ba–Ru/AC	9.1	400	1.0	18000	8285	[1]
Cs–Ru/MgO	6.0	400	1.0	18000	12117	[1]
Ru/C12A7:e^-	4.0	400	1.0	18000	6089	[1]
Ru/Pr_2O_3	5.0	400	1.0	18000	19000	[2]
$Ru/La_{0.5}Ce_{0.5}O_{1.75}$	5.0	400	1.0	72000	64000	[3]
$Ru/La_{0.5}Pr_{0.5}O_{1.75}$	5.0	400	1.0	72000	64000	[4]
$Ru/BaTiO_{2.5}H_{0.5}$	4.3	400	5.0	66000	20700	[5]
Ru/CaH_2	2.0	340	0.1	36000	4002	[6]
Ru/Ca_2N:e^-	1.8	340	0.1	36000	3386	[7]
Ru/Al_2O_3	10.0	315	0.08		25.0	[8]
Cs–Ru/Al_2O_3	10.0	315	0.08		141.5	[8]
Sm–Ru/Al_2O_3	10.0	315	0.08		114.6	[8]
Ru/γ-Al_2O_3	6.3	400	0.1	9000	789.2	[9]

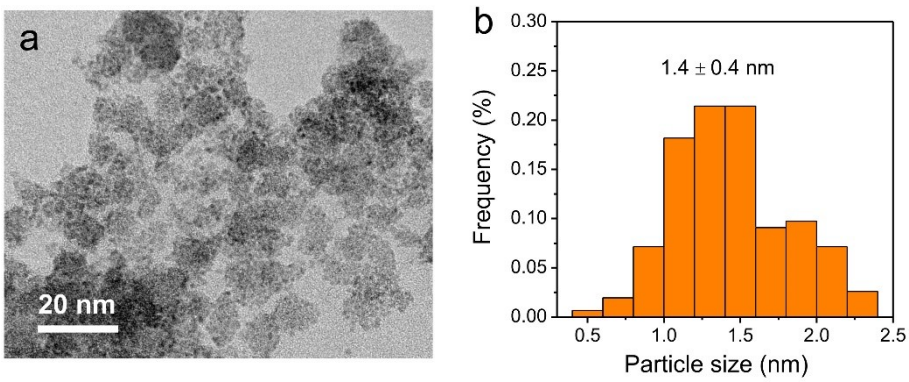

Fig. S1 TEM image (a) and particle size distribution (b) of RuO_2 NPs.

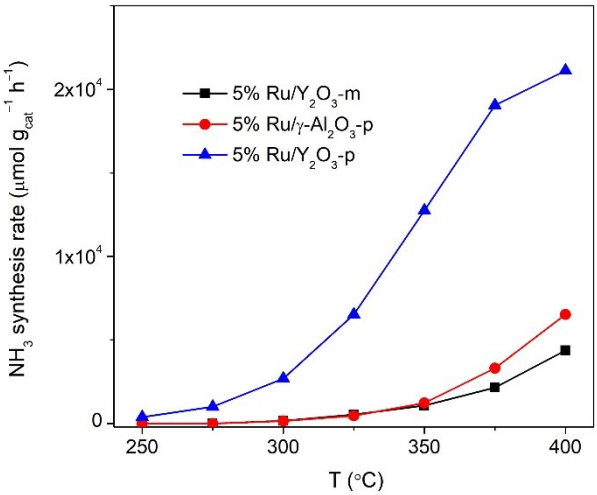

Fig. S2 Ammonia synthesis over 5% Ru/Y_2O_3-m, 5% Ru/γ-Al_2O_3-p and 5% Ru/Y_2O_3-p as a function of temperature under 1.0 MPa.

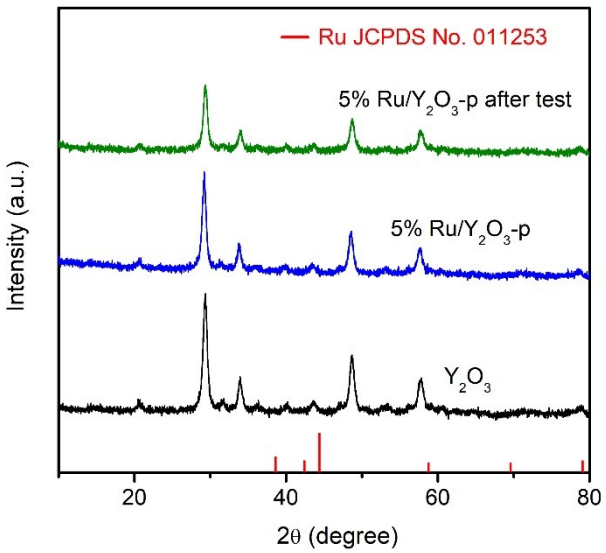

Fig. S3 XRD pattern of 5% Ru/Y_2O_3-p sample obtained after stability test.

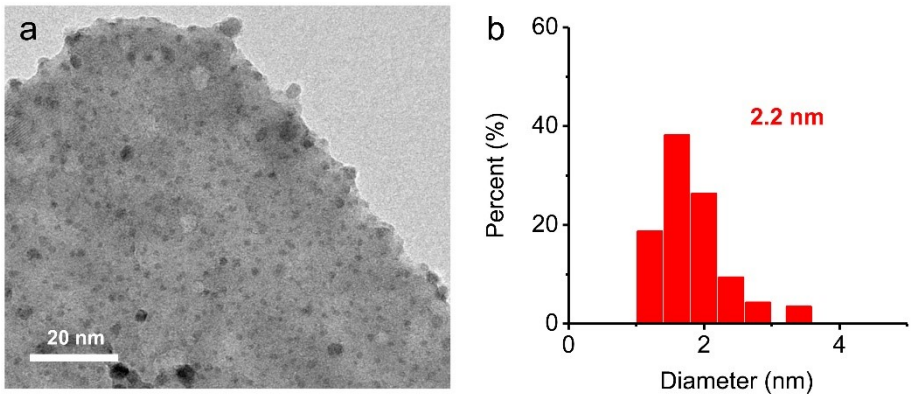

Fig. S4 TEM image and particle size distribution of 5% Ru/Y_2O_3-p sample obtained after stability test.

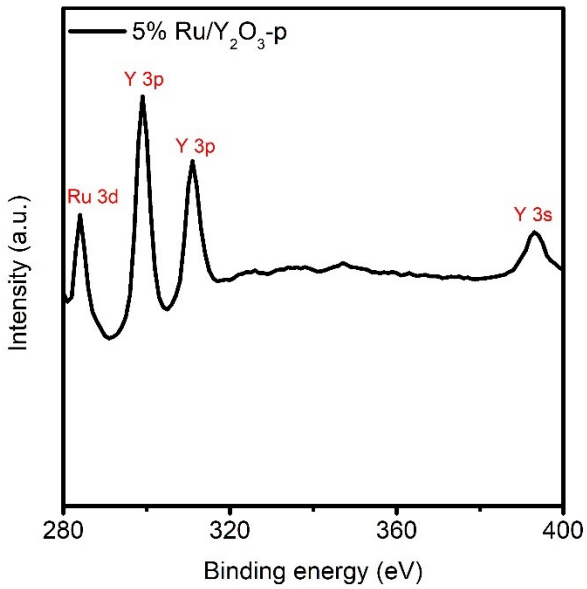

Fig. S5 XPS spectra of 5% Ru/Y_2O_3-p catalysts.

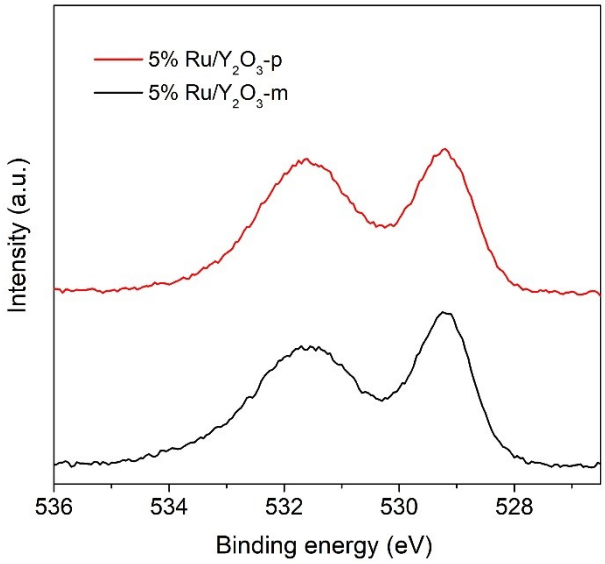

Fig. S6 O 1s core level XPS spectra of 5% Ru/Y_2O_3-m and 5% Ru/Y_2O_3-p catalysts.

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