

Article

# Role of Mixed Oxides in Hydrogen Production Through Dry Reforming of Methane Over Nickel Catalysts Supported on Modified $\gamma$ -Al<sub>2</sub>O<sub>3</sub>

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## Supporting Information

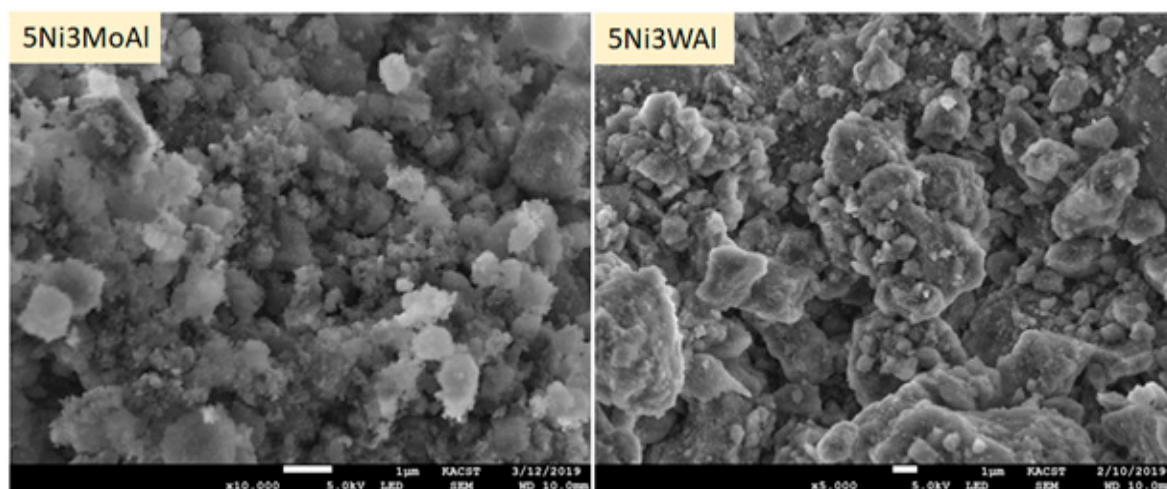


Figure S1. SEM image of different catalyst system.

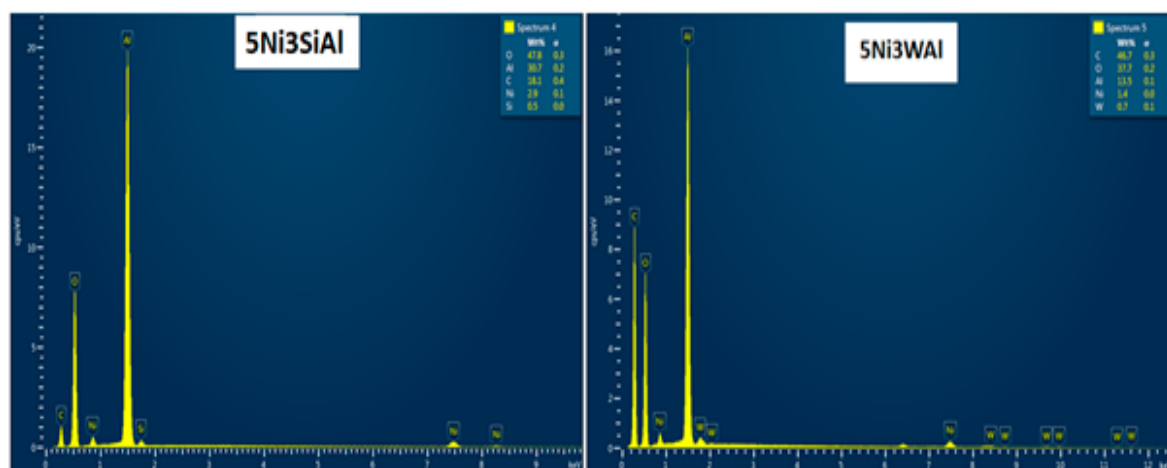


Figure S2. EDX spectra of different catalyst system.

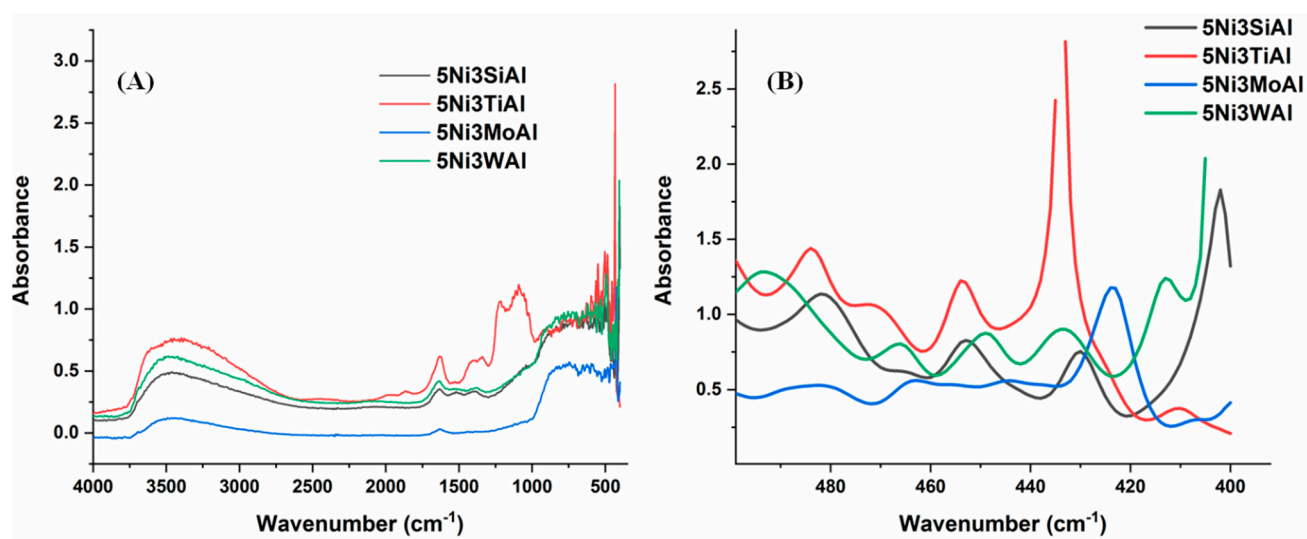
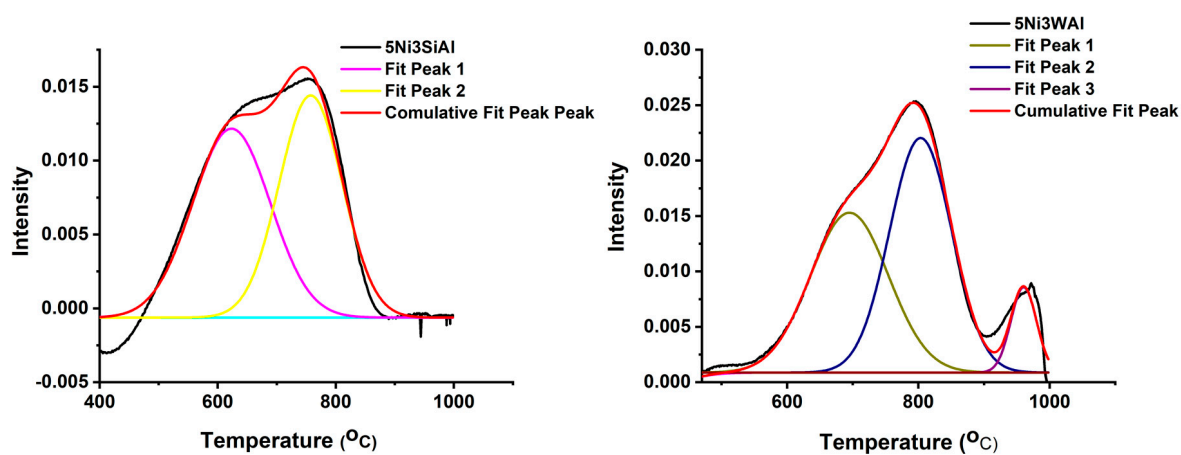


Figure S3. Infrared spectroscopy of different catalyst system.



Model	Gaussian		Model	Gaussian		
Equation	$y = y_0 + A/(w*\sqrt{\pi/(4*\ln(2))}) * \exp(-4*\ln(2)*(x-xc)^2/w^2)$		Equation	$y = y_0 + A/(w*\sqrt{\pi/(4*\ln(2))}) * \exp(-4*\ln(2)*(x-xc)^2/w^2)$		
Plot	Fit Peak 1	Fit Peak 2	Plot	Fit Peak 1	Fit Peak 2	Fit Peak 3
y0	-6.23062E-4 ± 4.11782E-5	-6.23062E-4 ± 4.11782E-5	y0	8.75357E-4 ± 2.76608E-4	8.75357E-4 ± 2.76608E-4	8.75357E-4 ± 2.76608E-4
xc	623.40187 ± 2.64164	757.55764 ± 1.71734	Xc	694.98475 ± 4.69806	803.46743 ± 2.27811	960.47305 ± 0.55166
A	2.10967 ± 0.07832	2.00929 ± 0.07676	A	2.14687 ± 0.18504	2.50601 ± 0.15739	0.37637 ± 0.02653
w	155.07424 ± 4.15424	125.59527 ± 2.48834	w	139.89097 ± 7.37806	111.24908 ± 2.83516	45.94283 ± 2.12497
Reduced Chi-Sqr	5.95E-07		Reduced Chi-Sqr	1.16E-06		
R-Square (COD)	0.9845		R-Square (COD)	0.98287		
Adj. R-Square	0.98421		Adj. R-Square	0.98232		

**Figure S4.** Deconvoluted H<sub>2</sub> temperature-programmed surface reduction profiles of (A) 5Ni<sub>3</sub>SiAl catalyst, and (B) 5Ni<sub>3</sub>WAl catalyst.