

## Supporting Information

### Highly Stable Ni/SiC Catalyst Modified by Al<sub>2</sub>O<sub>3</sub> for CO Methanation Reaction

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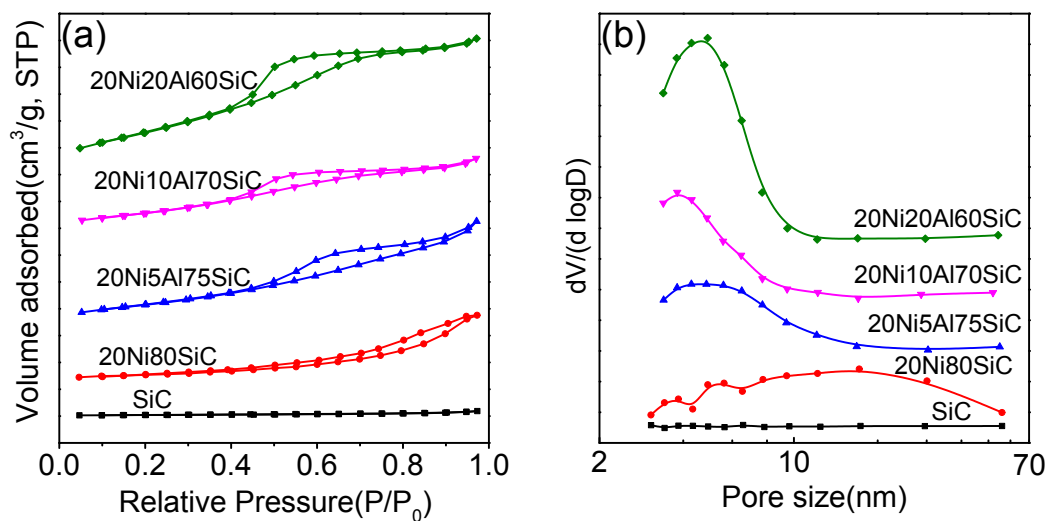
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**Table S1** The impurities of SiC measured by XRF and its physical properties

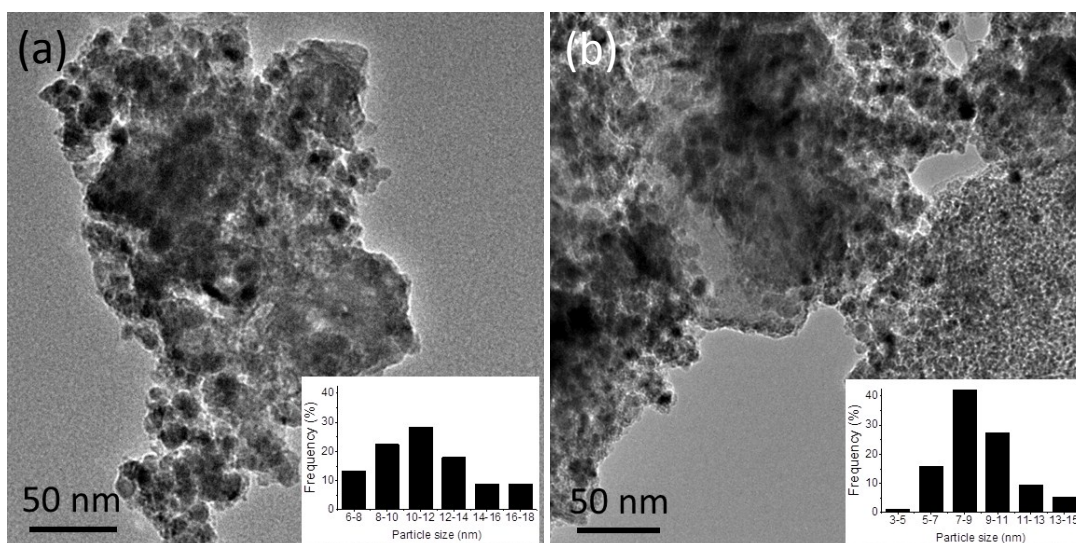
Impurity Elements	Fe	O	Al	Physical Properties	$S_{\text{BET}}^a$ ( $\text{m}^2 \text{g}^{-1}$ )	$V_p^b$ ( $\text{cm}^3 \text{g}^{-1}$ )
Content/ Weight %	0.0297	0.0413	0.0104		1	0.003

<sup>a</sup> Surface area derived from BET equation.

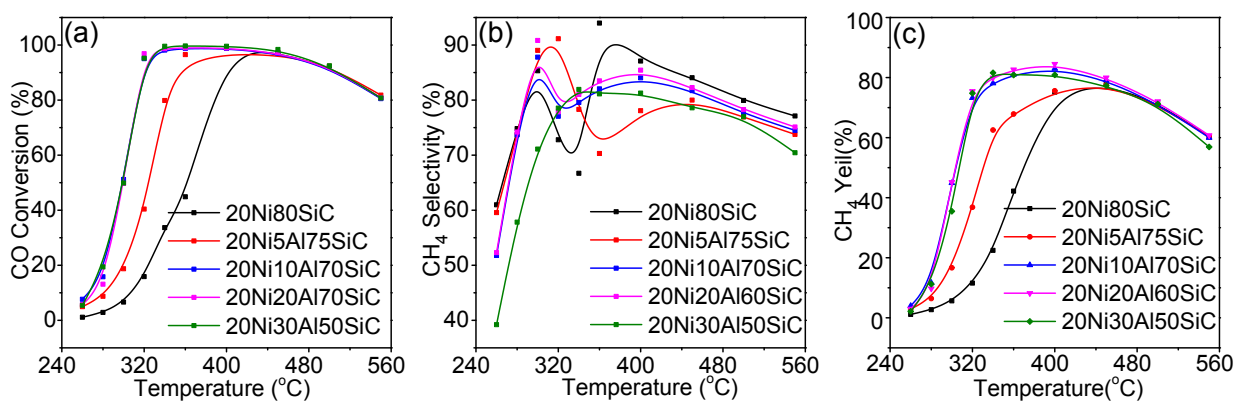
<sup>b</sup> Pore volume obtained from the volume of nitrogen adsorbed at the relative pressure of 0.97.



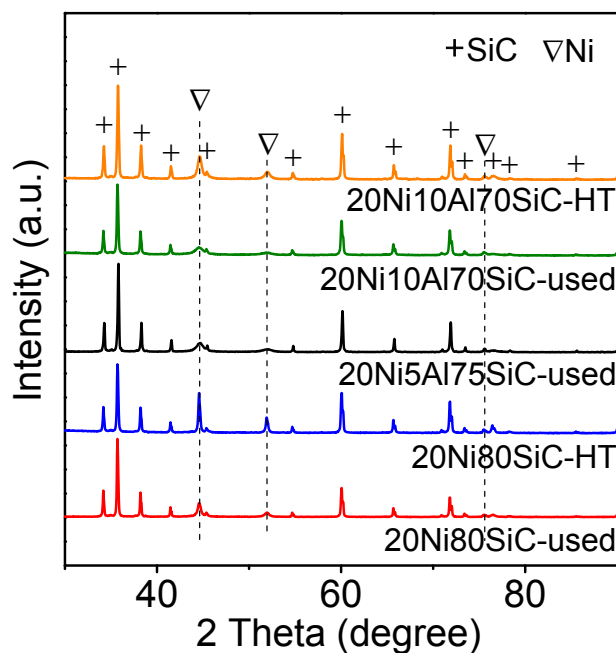
**Fig. S1** N<sub>2</sub> adsorption isotherms (a) and Pore size distribution curves (b) of all the as-calcined samples.



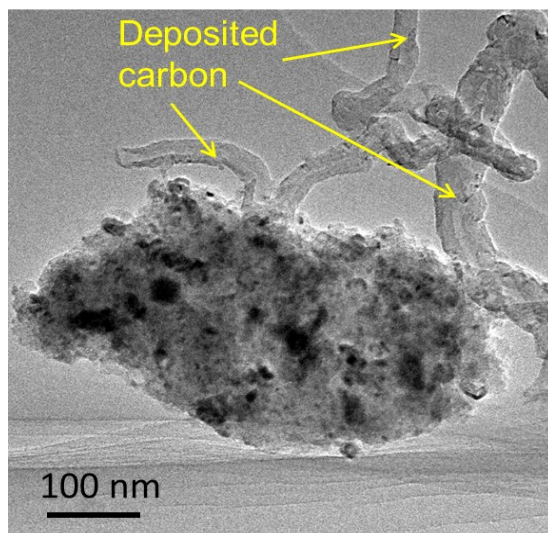
**Fig. S2** TEM images of the reduced catalysts: (a) 20Ni5Al75SiC, (b) 20Ni20Al60SiC.



**Fig. S3** Catalytic performances of catalysts in CO methanation under different reaction temperatures at 0.1 MPa and WHSV of 120 000 mL g<sup>-1</sup> h<sup>-1</sup>: (a) CO conversion, (b) CH<sub>4</sub> selectivity, and (c) CH<sub>4</sub> yield.



**Fig. S4** The wide-angle XRD patterns of 20Ni80SiC, 20Ni5Al75SiC and 20Ni10Al70SiC after lifetime test and 20Ni80SiC, 20Ni10Al70SiC after hydrothermal stability test.



**Fig. S5** TEM images of 20Ni80SiC after lifetime test.