Electronic Supplementary Information

Catalytic methane combustion over iron/nitrogen-doped silicon carbide

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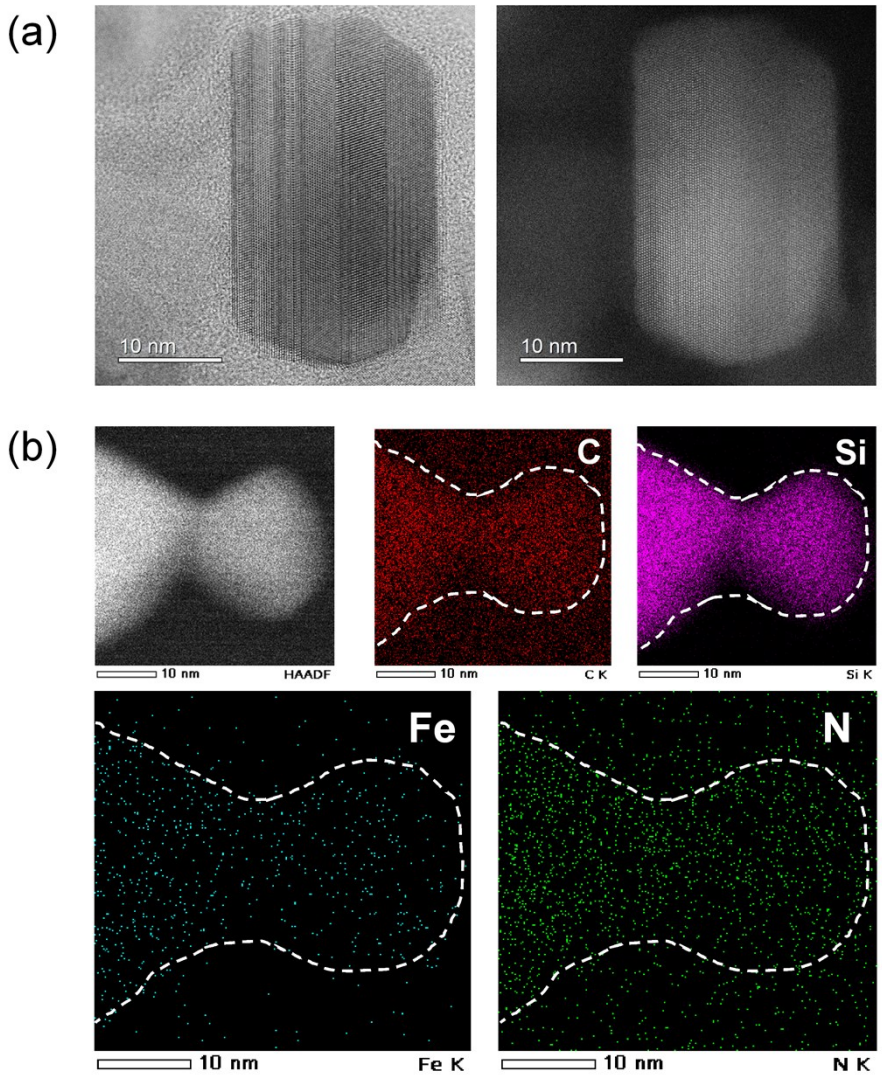

Fig. S1. (a) Representative high-resolution STEM (HR-STEM) image (left) and the corresponding high-angle annular dark-field scanning image (right) of Fe/N-SiC. (b) HR-STEM image of Fe/N-SiC and the corresponding EDX maps for C, Si, Fe and N atoms.

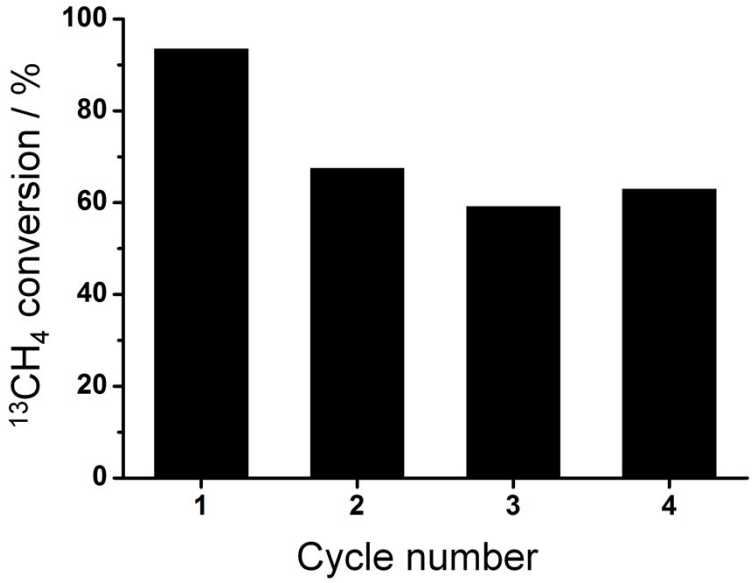

Fig. S2. $^{13}CH_4$ conversion after 12-h reaction period obtained by a cycle test of CH_4 combustion over Fe/N-SiC at 500 °C.

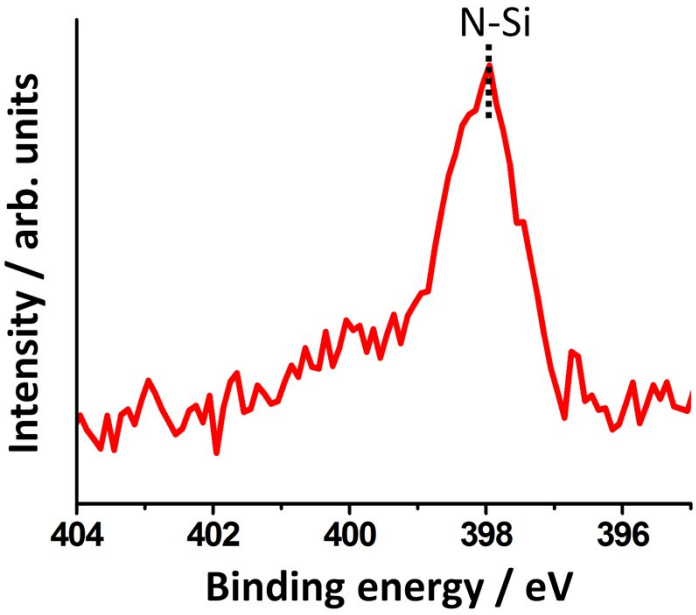

Fig. S3. N 1s XPS spectrum obtained for Fe/N-SiC.

Table S1. Concentrations of Fe and N atoms, as determined by ICP and XPS, respectively, and BET surface areas of the catalysts.

Catalyst	**Fe (atom%)**	**N (atom%)**	**BET (m^2/g)**
Fe/N-SiC	0.55	0.67	44
Fe-SiC	0.47	0.00	45
SiC	--	--	45

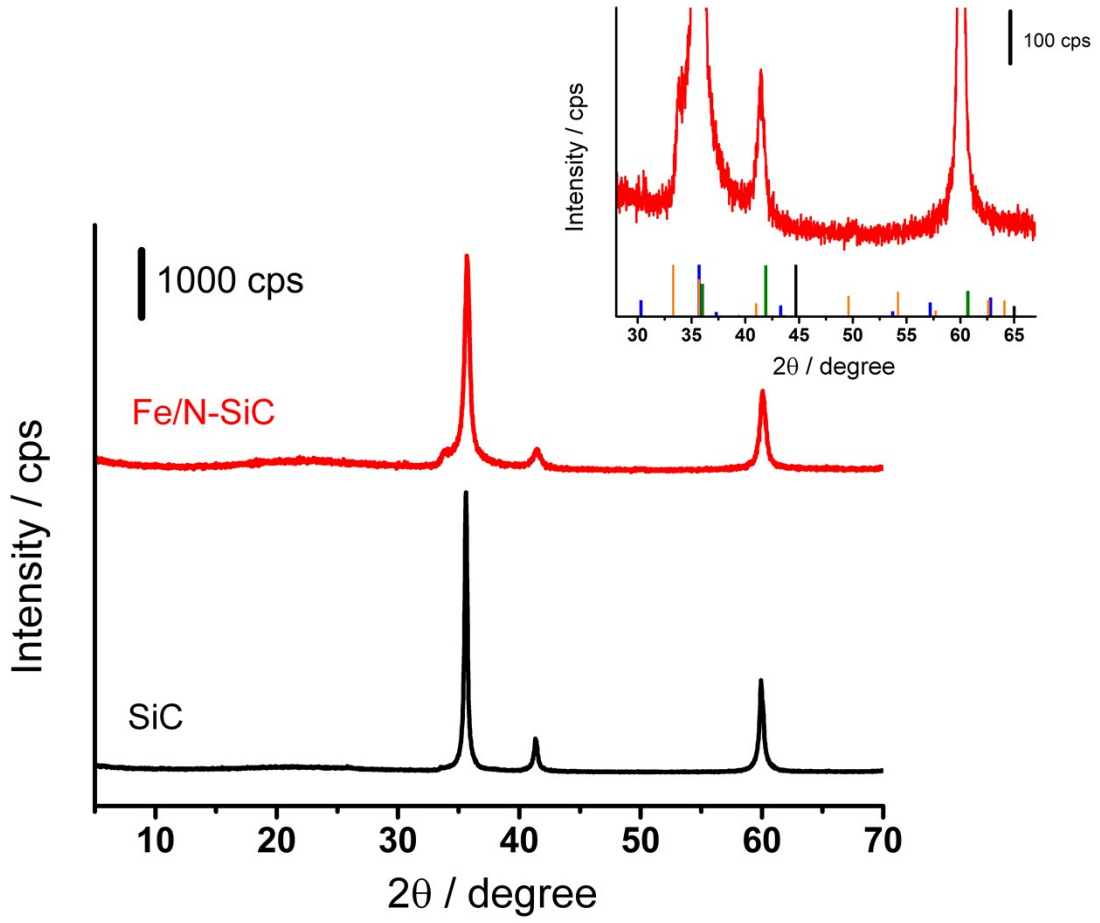

Fig. S4. XRD patterns of Fe/N-SiC (red) and SiC (black). The inset shows the magnified pattern for Fe/N-SiC. Peaks from bulk Fe (black), FeO (green), Fe_3O_4 (blue) and Fe_2O_3 (orange) are also denoted.

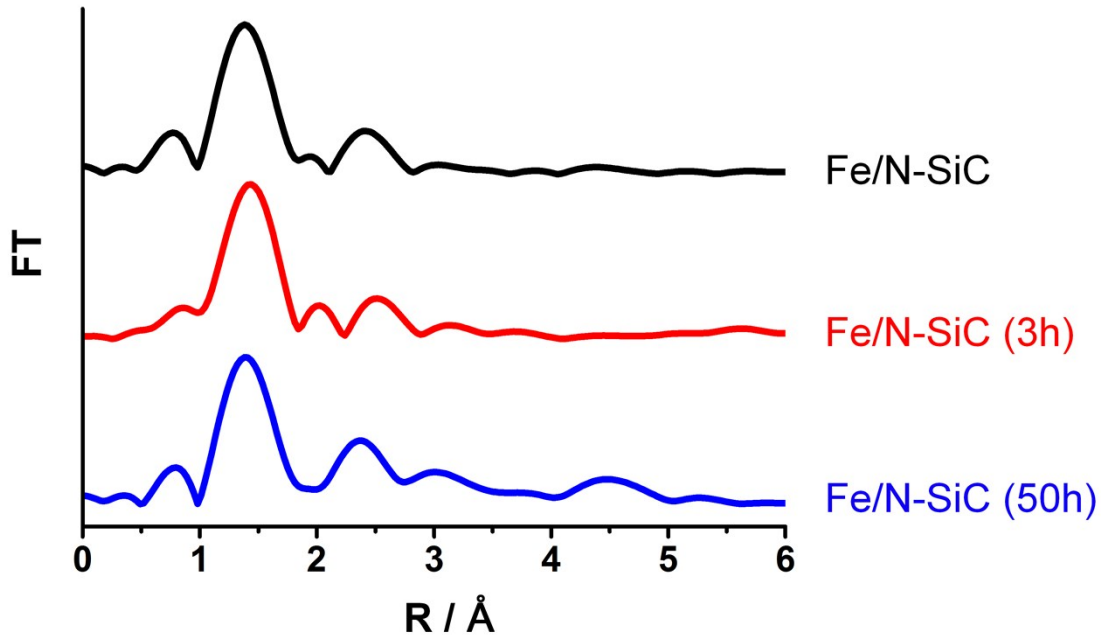

Fig. S5. Fourier transform of k^3-weighted EXAFS oscillations of Fe/N-SiC (black), Fe/N-SiC after 3-h reaction period (red) and Fe/N-SiC after 50-h reaction period (blue).