Supporting Information

Low-temperature methane combustion over Pd/H-ZSM-5: active Pd sites with specific electronic properties modulated by acidic sites of H-ZSM-5

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Nuclear Magnetic Resonance of Al (^{27}Al-NMR)

Figure S1 shows the changes on coordination environment of Al species of pure H-ZSM-5 and Pd/H-ZSM-5 catalysts. For the ^{27}Al NMR spectra of pure H-ZSM-5 (80:1), the resonance peaks at 57 ppm and 1 ppm could be correspondingly assigned to tetrahedrally coordinated framework aluminum and octahedral extra-framework aluminum[1, 2]. For the catalysts of Pd/H-ZSM-5, the disappearance of the resonance peak at 1 ppm demonstrates that the extra-framework aluminium species might be removed during the period of catalyst synthesis[3], which is further proved by the data of Pyridine FTIR and NH_3-TPD as shown in Figure 10 and 11.

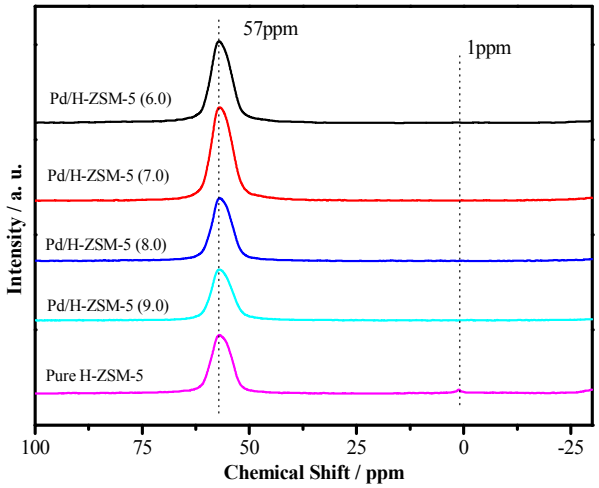

Figure S1. ^{27}Al NMR of pure H-ZSM-5 and Pd/H-ZSM-5 samples

Reference

[1] Guo W. P.; Xiong C. R.; Huang L. M.; Li Q. Z. *J. Mater. Chem.* 2001, 11, 1886-1890

[2] Pan F.; Lu X. C.; Zhu Q. S.; Zhang Z. M.; Yan Y.; Wang T. Z.; Chen S. W. *J. Phys. Chem. A* 2014, 2, 20667-20675

[3] Na K.; Alayoglu S.; Ye R.; Somorjai G. A. *J. Am. Chem. Soc.* 2014, 136, 17207-17212