Curriculum Vitae

Feng Deng

Professor
State Key Laboratory of Magnetic Resonance Spectroscopy and Imaging
National Center for Magnetic Resonance in Wuhan
Wuhan Institute of Physics and Mathematics
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Education

09/1984-06/1988 B.S. in Physical Chemistry, Department of Chemistry, Chengdu University of Science and Technology (now Sichuan University), P. R. China

09/1988 -06/1991 M.S. in Nuclear Magnetic Resonance, Wuhan Institute of Physics, CAS (supervisor: Prof. Youru Du)

09/1993 - 06/1996 Ph.D in Nuclear Magnetic Resonance, Wuhan Institute of Physics, CAS (supervisor: Prof. Chaohui Ye and Prof. Youru Du)

Postdoctoral Training

10/1997-12/1998 Research Fellow, Chemistry Department, Texas A & M University, USA (with Prof. James F. Haw, working on in-situ solid-state NMR studies of heterogeneous catalytic reactions in zeolites)

Faculty Academic Appointments

07/1991-05/1993 Research assistant, Wuhan Institute of Physics, CAS

06/1993-06/1996 Assistant professor, Wuhan Institute of Physics, CAS

07/1996-11/1999 Associate professor, Wuhan Institute of Physics and Mathematics, CAS

12/1999-present Professor, Wuhan Institute of Physics and Mathematics, Innovation Academy for Precision Measurement Science and Technology, CAS; Group Leader of Solid-state NMR Spectroscopy and Heterogeneous Catalysis

09/2008-07/2020 Vice director of National Centre for Magnetic Resonance in Wuhan

04/2005-11/2016 Vice director of State Key Laboratory of Magnetic Resonance and Atomic and Molecular Physics

12/2016-12/2023 Director of State Key Laboratory of Magnetic Resonance and Atomic and Molecular Physics

Main research activities:

Solid-state NMR methodology

Solid-state NMR spectroscopy and DFT calculation studies of heterogeneous catalysts (including zeolites, MOFs, metal oxides, heteropoly acids etc) and relevant catalytic reactions

Solid-state NMR characterization of functional materials

Awards:

Wang T. C. Award for Magnetic Resonance Spectroscopy (2000)
Distinguished Young Scholars supported by National Science Foundation of China (Physical Chemistry, 2004)

Academic Positions:

Council Member of the International Society of Magnetic Resonance (ISMAR)
Committee Member of Chinese Magnetic Resonance Society
Committee Member of Chinese Catalysis Society
Committee Member of Chinese Zeolite Society
Committee Member of Chinese Physical Chemistry Society
Editorial Board of *Solid State Nuclear Magnetic Resonance*
Editorial Board of *Magnetic Resonance Letter*
Editorial Board of *Chinese Science Bulletin*
Editorial Board of *Chinese Journal of Magnetic Resonance*
Editorial Board of *Chemical Journal of Chinese Universities*
Editorial Board of *Acta Physico-Chimica Sinica*

Publications

More than 400 papers have been published in journals including *Science, Nat Catal, Nat Commun, Chem Rev, Chem Soc Rev, Acc Chem Res, Natl Sci Rev, JACS, Angew Chem Int Ed, Chem, Adv Mater, Chem Sci, Chem Commun, JPCL, JPC, JCP, PCCP, ACS Catal, J Catal, J Magn Reson, Magn Reson Chem, Solid State Nucl Magn Reson, Prog Nucl Magn Reson Spectrosc etc*, which have been cited over 19000 times (web of science) by other authors. Selected publications are listed in the following:

1. Li, G.C.; Foo1, C.; Fan, R.; Zheng, M.J.; Wang, Q.; Chu, Y.Y.; Li, J.; Day, S.; Steadman, P.; Tang, C.; Benedict Lo, T.W.*; **Deng, F.***; Tsang, S. C. E.* Atomic locations and adsorbate interactions of Al single and pair sites in H-ZSM-5 zeolite *Science* **2025**, 387:388-393.
2. Wang, C.; Hu. M.; Xu, J.*; **Deng, F.*** Mechanistic studies of zeolite catalysis via *in situ* solid-state nuclear magnetic resonance spectroscopy: progress and prospects *Front. Chem. Sci. Eng.* **2025**, 19: 1-29
3. Zhou, X.; Chu, Y.Y.; Wang, C.; Wang, Q.; Hu, M.; Xu. J.*; **Deng, F.** Unveiling Active Al^{3+} Sites for Ethanol Dehydration on γ-Al_2O_3 with Solid-State Nuclear Magnetic Resonance Spectroscopy *J. Phys. Chem. Lett.* **2025**, 16: 53-59.
4. Yang, L.X.; Ni, N.; Xing, E.H.; Chu, Y.Y.; Feng, N.D.; Chen, Y.; Luo, Y.B.; Gao, X. Z.*; Xu, G.T.*; **Deng, F.***; Shu, X.T. Structure of Hydrothermally Stable Acid Sites and their Catalytic Role in P-Modified ZSM-5 Zeolite Revealed by Solid-State NMR Spectroscopy *Inorg. Chem.* **2025**, 64, 1352-1364.
5. Zheng, M.J.; Wang, Q.*; Chu, Y.Y. ; Tan, X.H.; Huang, W. D.; Xi, Y.J.; Wang,Y.X.; Qi, G.D.; Xu, J.*; Hong, S.B.; **Deng, F.*** Revealing the Brønsted Acidic Nature of Penta-Coordinated Aluminum Species in Dealuminated Zeolite Y with Solid-State NMR Spectroscopy *J. Am. Chem. Soc.* **2024**, 146: 29417-29428.
6. Wang, C.; Zheng, M.J.; Hu, M.; Cai, W.J.; Chu, Y.Y.; Wang, Q.; Xu, J.*; **Deng, F.*** Unraveling Spatially Dependent Hydrophilicity and Reactivity of Confined Carbocation

Intermediates during Methanol Conversion over ZSM-5 Zeolite *J. Am. Chem. Soc.* **2024**, 146: 8688-8696.
7. Chen, W.H.; Li, S.H.*; Yi, L.Z.; Chen, Z.Y.; Li, Z.H.; Wu, Y.F.; Yan, W.; **Deng, F.***; Deng, H.X.* Precise Distance Control and Functionality Adjustment of Frustrated Lewis Pairs in Metal-Organic Frameworks *J. Am. Chem. Soc.* **2024**, 146: 12215-12224.
8. Cai, W.J.; Wang, C.*; Chu, Y.Y.; Hu, M.; Wang, Q.; Xu, J.*; **Deng, F.** Unveiling the Brønsted acid mechanism for Meerwein-Ponndorf-Verley reduction in methanol conversion over ZSM-5 *Nat. Commun.* **2024**, 15:8736
9. Wang, C.; Chu, Y.Y.; Xiong, D.F.; Wang, H.F.; Hu, M.; Wang, Qiang; Xu, J.*; **Deng, F.*** Water-induced Micro-hydrophobic Effect Regulates Benzene Methylation in Zeolite *Angew. Chem. Int. Ed.* **2024**, 63: e202313974
10. Wang, C.; Chu, Y.Y.; Lei, Q.F.; Hu, M.; **Deng, F.**; Xu, J.*; Dai, W.L.* In Situ Observation of Solvent-Mediated Cyclic Intermediates during the Alkene Epoxidation/ Hydration over a Ti-Beta/H_2O_2 System *Angew. Chem. Int. Ed.* **2024**, 63: e202404633
11. Yang, L.X.; Huang, M.; Feng, N.D.*; Wang, M.; Xu, J.; Jiang, Y.; Ma, D.*; **Deng, F.*** Unraveling the Atomic Structure and Dissociation of Interfacial Water on Anatase TiO_2 (101) under Ambient Conditions with Solid-State NMR Spectroscopy *Chem. Sci.* **2024**, 15, 11902-11911.
12. Wang, X.X.; Wang, C.; Chu, Y.Y.; Liu, Y.H.; Hu, M.; **Deng, F.**; Xu, J.*; Yu, J.H.* Deciphering the Link between Zeolite Crystal Size, Brønsted Acid Site Distribution, and Dual-Cycle Selectivity in Methanol-to-Olefins over Zeolite *ACS Catal.* **2024**, 14:15609-15621.
13. Gao, W.; Qi, G.D.*; Wang, C.; Wang, Q.; Liang, J.W.; Xu, J.*; **Deng, F.** Molybdenum/ ZSM‐5 Catalyzes Methane Co-Aromatization with Furan: Unveiling the Mechanism with Solid-State NMR *ACS Catal.* **2024**, 14:8220-8231.
14. Wang, W.Y.; Lewis, R.J.; Lu, B.T.; Wang, Q.; Hutchings, G.J.; Xu, J.*; **Deng, F.** The Role of Adsorbed Species in 1-Butene Isomerization: Parahydrogen-Induced Polarization NMR of Pd-Au Catalyzed Butadiene Hydrogenation *ACS Catal.* **2024**, 14: 2522-2531.
15. Cao, J.X.; Qi, G.D.; Yao, B.Q.; He, Q.; Lewis, R.J.; Li, X.; **Deng, F.**; Xu, J.*; Hutchings, G.J.* Partially Bonded Aluminum Site on the External Surface of Post-treated Au/ZSM‐5 Enhances Methane Oxidation to Oxygenates *ACS Catal.* **2024**, 14: 1797-1807.
16. Xiao, Y.Q.; Li, S.H.*; Jiang, B.; Liang, X.M.; Chu, Y.Y.*; **Deng, F.*** Effect of Co-Adsorbed Guest Adsorbates on the Separation of Ethylene/Ethane Mixtures on Metal-Organic Frameworks with Open Metal Sites *Chem. Eur. J.* **2024**, 30: e202401006.
17. Zheng, M.J.; Chu,Y.Y.; Wang, Q.*; Wang, Y.X.; Xu, J.; **Deng, F.*** Advanced solid-state NMR spectroscopy and its applications in zeolite chemistry *Prog. Nucl. Magn. Reson. Spectrosc.* **2024**, 140-141: 1-41.
18. Feng, N.D.; Xu, J.*; **Deng, F.*** Solid-state NMR of active sites in TiO_2 photocatalysis: a critical review *Chem Synth.* **2024**, 4, 43.
19. Gao, W.; Wang, Q.*; Qi, G.D.; Liang, J.W.; Wang, C.; Xu, J.*; **Deng, F.*** Active Ensembles in Methane Dehydroaromatization over Molybdenum/ZSM-5 Zeolite Identified by 2D ^{1}H-^{95}Mo Magic Angle Spinning Nuclear Magnetic Resonance Correlation Spectroscopy *Angew. Chem. Int. Ed.* **2023**, 62: e202306133.

20. Wang, W.Y.; Wang, Q.; Xu, J.*; **Deng, F.** Understanding Heterogeneous Catalytic Hydrogenation by Parahydrogen-Induced Polarization NMR *ACS Catal.* **2023**, 13:3501-3519.
21. Wang, X.; Zeng, S.Q.; Qi, G.D.* ; Wang, Q.; Xu, J.*; **Deng, F.** CO Oxidation over Embedded Pt Nanoparticles on Al_2O_3 with Al Coordination Flexibility *Chem. Commun.* **2023**, 59: 7783-7786.
22. He, C.Y.; Li, S.H.*; Jiang, B.; Chen, F.; Hu, W.; **Deng, F.*** Surface Hydrophobicity and Guest Permeability in Polydimethylsiloxane-Coated MIL-53 as Studied by Solid-State Nuclear Magnetic Resonance Spectroscopy *ACS Appl. Mater. Interfaces* **2023**, 15 :37936-37945.
23. Wang, T.S.; Chu, Y.Y.; Li, X.; Liu, Y.H.; Luo, H.; Zhou, D.L.; **Deng, F.***; Song, X.W.*; Lu, G.Y.; Yu, J. H.* Zeolites as a Class of Semiconductors for High-Performance Electrically Transduced Sensing *J. Am. Chem. Soc.* **2023**, 145: 5342-5352.
24. Cao, J.X.; Lewis, R.J.; Qi, G.D.; Bethell, D.; Howard, M.J.; Harrison, B.; Yao, B.Q.; He,Q.; Morgan, D.J.; Ni, F.L.; Sharma, P.; Kiely, C.; Li, X.; **Deng, F.**; Xu, J.*; Hutchings, G.J.* Methane Conversion to Methanol Using Au/ZSM-5 is Promoted by Carbon *ACS Catal.* **2023**, 13:7199-7209.
25. Xiong, Z.P.; Qi, G.D.; Zhan, E.S.*; Chu, Y.Y.; Xu, J.*; Wei, J.K.; Ta, N.; Hao, A.J.; Zhou, Y.; **Deng, F.**; Shen, W.J.* Experimental identification of the active sites over a plate-like mordenite for the carbonylation of dimethyl ether *Chem* **2023**, 9:76-92.
26. Xu, R.T.; Wang, Q.; Wang,W.Y.; Bao, Q.J.; Zhang, Z.; Liu, Z.Y.; Xu, J.*; **Deng, F.** In Situ NMR Imaging of Solvent Infiltration on γ-Al_2O_3 Particles *Chem. J. Chinese Universities* **2023**, 44 :20220587.
27. Xiong, W.P.; Chu,Y.Y.*; Wang, Q.*; Xu, J.; **Deng, F.*** Theoretical Calculation of Relationship Between Zeolite Confinement Effect and Adsorbed 2-^{13}C-acetone ^{13}C Chemical Shift *Chem. J. Chinese Universities* **2023**, 44, 20230063.
28. Wang, W.Y.; Xu, J.*; **Deng, F.*** Recent advances in solid-state NMR of zeolite catalysts *Natl. Sci. Rev.* **2022**, 9: nwac155
29. Xiao, Y.Q.; Li, S.H.*; Xu, J.; **Deng, F.*** Solid-state NMR studies of host-guest chemistry in metal-organic frameworks *Current Opinion in Colloid & Interface Science* **2022**, 61:101633
30. Zheng, M.J.; Zeng, S.Q.; Wang, X. M.; Gao, X.Z.; Wang, Q.*; Xu, J.;* **Deng, F.*** Heteronuclear-filtered ^{1}H homonuclear multi-quantum correlation experiment at 100 kHz magic-angle spinning *Magn. Reson. Lett.* **2022**, 2: 266-275.
31. Hu, M.; Wang, C.; Chu, Y.Y.; Wang, Q.; Li, S.H.; Xu, J.*; **Deng, F.** Unravelling the reactivity of framework Lewis acid sites towards methanol activation on H-ZSM-5 zeolite with solid-state NMR spectroscopy *Angew. Chem. Int. Ed.* **2022**, 61: e202207400.
32. Wang, W.Y.; Sun, Q.M.; Wang, Q.; Li, S.H.; Xu, J.*; **Deng, F.*** Heterogeneous parahydrogen induced polarization on Rh-containing silicalite-1 zeolites: effect of the catalyst structure on signal enhancement *Catal. Sci. Technol.* **2022**, 12: 4442-4449
33. Wang, C.; Chu, Y.Y.; Hu, M.; Cai, W.J.; Wang, Q.; Li, S.H.; Xu, J.*; **Deng, F.** Influence of zeolite confinement effects on cation-π interactions in methanol-to-hydrocarbon conversion *Chem. Commun.* **2022**, 58:9242-9245.

34. Zhou, X.; Wang, C.; Chu, Y.Y.; Wang, Q.; Xu, J.*; **Deng, F.*** Mechanistic insight into ethanol dehydration over SAPO-34 zeolite by solid-state NMR spectroscopy *Chem. J. Chinese Universities* **2022**, 38:155-160.
35. Tang, J.; Li, S.H.*; Xu, J.; **Deng, F.*** Spectroscopic characterizations of porous mixed metal oxides derived from metal-organic framework MIL-53(Ga, Al) for propane dehydrogenation *J. Phys. Chem. C* **2022,** 126:13485-13495.
36. Ahn, S.H.; Wang, Q.; Wang, Y.X.; Chu, Y.Y.; **Deng, F.**; Hong, S.B.* Identifying crystallographically different Si-OH-Al Bronsted acid sites in LTA zeolites *Angew. Chem. Int. Ed.* **2022**, 61: e202203603.
37. Xiong, Z.P.; Qi, G.D.; Bai, L.Y.; Zhan, E.S.*; Chu, Y.Y.; Xu, J.*; Ta, N.; Hao, A.J.; **Deng, F.**; Shen,W.J. Preferential population of Al atoms at the T4 site of ZSM-35 for the carbonylation of dimethyl ether *Catal. Sci. Technol.* **2022**, 12: 4993-4997.
38. Bin, G.; Bin Q.; Zheng, M.J.; Liu, Z.K.; Lu, W.D.; Wang, Q.; Xu, J.*; **Deng, F.**; Lu, A.H.* Dynamic self-dispersion of aggregated boron clusters into stable oligomeric boron species on MFI zeolite nanosheets under oxidative dehydrogenation of propane *ACS Catal.* **2022**, 12: 7368-7376.
39. He, C.Y.; Li, S.H.*; Xiao, Y.Q.; Xu, J.; **Deng, F.*** Application of solid-state NMR techniques for structural characterization of metal-organic frameworks *Solid State Nucl. Magn. Reson.* **2022**, 117:101772.
40. Xiao, Y.Q.; Chu, Y.Y.; Li, S.H.*; Xu, J.; **Deng, F.*** Preferential adsorption sites for propane propylene separation on ZIF-8 as revealed by solid-state NMR spectroscopy *Phys. Chem. Chem. Phys.* **2022**, 24:6535-6543.
41. Yang, L.X.; Feng, N.D.*; **Deng, F.*** Aluminum-doped TiO_2 with dominant {001} facets: microstructure and property evolution and photocatalytic activity *J. Phys. Chem. C* **2022**, 126: 5555-5563.
42. Qi, G.D.; Davies, T.E.; Nasrallah, A.; Sainna, M.A.; Howe, A.; Lewis, R.J.; Quesne, M.; Catlow, C. R.A.; Willock, D. J.; He, Q.; Bethell, D.; Howard, M. J.; Murrer, B. A.; Harrison, B.; Kiely, C.J. ; Zhao, X.L.; **Deng, F.**; Xu, J.*; Hutchings, G.J.* Au-ZSM-5 catalyses the selective oxidation of CH_4 to CH_3OH and CH_3COOH using O_2 *Nat. Catal.* **2022**, 5:45-54
43. Wang, C.; Chu, Y.Y.; Hu, M.; Cai, W.J.; Wang, Q.; Qi, G.D.; Li, S.H.; Xu, J.*; **Deng, F.** Insight into carbocation induced non-covalent interactions in methanol-to-olefins reaction over ZSM-5 zeolite from solid-state NMR spectroscopy *Angew. Chem. Int. Ed.* **2021**, 60, 26847-26854.
44. Wang, C ; Zhao, X.L.; Hu, M.; Qi, G.D.; Wang, Q.; Li, S.H.; Xu, J.*; **Deng, F.** Unraveling hydrocarbon pool boosted propane aromatization on gallium/ZSM-5 zeolite by solid-state NMR spectroscopy *Angew. Chem. Int. Ed.* **2021**, 60, 23630-23634.
45. Gao, W.; Qi, G.D.; Wang, Q.; Wang, W.Y.; Li, S.H.; Hung, I.; Gan, Z.H.; Xu, J.*; **Deng, F.** Dual active sites on molybdenum/ZSM-5 catalyst for methane dehydroaromatization: insights from solid-state NMR spectroscopy *Angew. Chem. Int. Ed.* **2021**, 60: 10709-10715.
46. Qi, G.D.; Wang, Q.; Xu, J.*; **Deng, F.** Solid-state NMR studies of internuclear correlations for characterizing catalytic materials *Chem. Soc. Rev.* **2021**, 50: 8382-8399.
47. Zheng, M.J.; Xin, S.H.; Wang, Q.*; Trebosc, J.; Xu, J.; Qi, G.D.; Feng, N.D.; Lafon, O.*; **Deng, F.*** Through-space ^{11}B-^{27}Al correlation: influence of the recoupling channel *Magn. Reson. Chem.* **2021**, 59:1062-1076.

48. Xiao, Y.Q.; Chu, Y.Y.; Li, S.H.*; Chen, F.; Gao, W.; Xu, J.; **Deng, F.*** Host-guest interaction in ethylene and ethane separation on zeolitic imidazolate frameworks as revealed by solid-state NMR spectroscopy *Chem. Eur. J.* **2021**, 27: 11303-11308.
49. Tang, J.; Chu, Y.Y.; Li, S.H.*; Xu, J.; Xiong, W.P.; Wang, Q.; **Deng, F.*** Breathing effect via solvent inclusions on the linker rotational dynamics of functionalized MIL-53 *Chem. Eur. J.* **2021**, 27: 14711-14720.
50. Wang, Y.X.; Xin, S.H.; Chu, Y.Y.*; Xu, J.; Qi, G.D.; Wang, Q.*; Xia, Q.H.; **Deng, F.*** Influence of trimethylphosphine oxide loading on the measurement of zeolite acidity by solid-state NMR spectroscopy *J. Phys. Chem. C* **2021**, 125:9497-9506.
51. Wang, W.Y.; Wang, Q.; Chu, Y.Y.; Qi, G.D.; Li, S.H.; Xu, J.*; **Deng, F.** Pairwise stereoselective hydrogenation of propyne on supported Pd-Ag catalysts investigated by parahydrogen-induced polarization *J. Phys. Chem. C* **2021**, 125:17144-17154.
52. Qi, G.D.; Ye, X.D.; Xu, J.*; **Deng, F.*** Progress in NMR studies of carbohydrates conversion on zeolites *Chem. J. Chinese Universities-Chinese* **2021**, 42:148-164.
53. Feng, N.D.*; Lin, H.W.; Song, H.; Yang, L.X.; Tang, D.M.; **Deng, F.**; Ye, J.H.* Efficient and selective photocatalytic CH_4 conversion to CH_3OH with O_2 by controlling overoxidation on TiO_2 *Nat. Commun.* **2021**, 12: 4652.
54. Yang, L.; Wang, C.; Zhang, L.N.; Dai, W.L.*; Chu, Y.Y.; Xu, J.; Wu, G.J.; Gao, M.B.; Liu, W.J.; Xu, Z.C.; Wang, P.F.; Guan, N.J.; Dyballa, M.; Ye, M.; **Deng, F.**; Fan, W.B.; Li, L.D. Stabilizing the framework of SAPO-34 zeolite toward long-term methanol-to-olefins conversion *Nat. Commun.* **2021**, 12: 4661
55. Feng, N.D.; Lin, H.W.; **Deng, F.**; Ye, J.H.* Interfacial-bonding Ti-N-C boosts efficient photocatalytic H_2 evolution in close coupling g-C_3N_4/TiO_2 *J. Phys. Chem. C* **2021**, 125: 12012-12018.
56. Wang, Q.; Li, W.Z.; Hung, I.; Mentink-Vigier, F.; Wang, X.L.; Qi, G.D.; Wang, X.; Gan, Z.H.; Xu, J.*; **Deng, F.** Mapping the oxygen structure of γ-Al_2O_3 by high field solid-state NMR spectroscopy *Nat. Commun.* **2020**, 11:3620.
57. Wang, C.; Hu, M. ; Chu, Y.Y.; Zhou, X. ; Wang, Q.; Qi, G.; Li, S.H.; Xu, J.*; **Deng, F.** π-interaction between cyclic carbocations and aromatics causes zeolite deactivation in methanol-to-hydrocarbons conversion *Angew. Chem. Int. Ed.* **2020**, 59:7198-7202.
58. Qi, G.D.; Chu,Y.Y.; Wang, Q.; Wang, X.X.; Li, Y.; Trebosc, J.; Lafon, O.; Xu, J*; **Deng, F.** Gem-diol-type intermediate in the activation of a ketone on Sn-β zeolite as studied by solid-state NMR spectroscopy *Angew. Chem. Int. Ed.* **2020**, 59:19532-19538.
59. Yan,W.; Li, S.H.*; Yang,T.; Xia, Y.C.; Zhang, X.R.; Wang, C.; Yan, Z.; **Deng, F.***; Zhou, Q.H.; Deng, H.X.* Molecular vises for precisely positioning ligands near catalytic metal centers in metal-organic frameworks *J. Am. Chem. Soc.* **2020**, 142:16182-16187.
60. Li, S. H.; Lafon, O.; Wang, W.Y.; Wang, Q,; Wang, X.X.; Li, Y.; Xu, J.*; **Deng, F.** Recent advances of solid-state NMR spectroscopy for microporous materials *Adv. Mater.* **2020**, 32, 2002879.
61. Hu, M.; Wang, C.; Gao, X.Z.; Chu, Y.Y.; Qi, G.D.; Wang, Q.; Xu, J.*; **Deng F.*** Establishing a link between the dual cycles in methanol-to-olefins conversion on H-ZSM-5: aromatization of cycloalkenes *ACS Catal.* **2020**, 10:4299-4305.
62. Wang, C.; Xu J.*; **Deng, F.*** The mechanism of methanol-to-hydrocarbon reactions over acidic zeolites: a solid-state NMR perspective *ChemCatChem* **2020**, 12:965-980.

63. Zhao, X.L.; Xu, J.*; Qi, G.D.; Wang, Q.; Gao,W.; Li, S.H.; Feng, N.D.; **Deng, F.*** Multiple methane activation pathways on Ga-modified ZSM-5 zeolites revealed by solid-state NMR spectroscopy *ChemCatChem* **2020**, 12: 3880-3889.
64. Zhao, X.L.; Chu,Y.Y.; Qi, G.D.; Wang, Q.; Gao,W.; Wang, X.; Li, S.H.; Xu, J.*; **Deng, F.** Probing the active sites for methane activation on Ga/ZSM-5 zeolites with solid-state NMR spectroscopy *Chem. Commun.* **2020**, 56:12029-12032.
65. Xiao, Y.Q.; Chu, Y.Y.; Li, S.H.*; Su, Y.C.; Tang, Xu, J.; **Deng, F**.* Primary adsorption sites of light alkanes in multivariate UiO-66 at room temperature as revealed by solid-state NMR *J. Phys. Chem. C* **2020**, 124:3738-3746.
66. Tang, J.; Li, S.H.*; Su, Y.C.; Chu,Y.Y.; Xu, J.; **Deng, F.*** Quantitative analysis of linker composition and spatial arrangement of multivariate metal-organic framework UiO-66 through ^{1}H fast MAS NMR *J. Phys. Chem. C* **2020**, 124:17640−17647
67. Zhao, X.L.; Xu J.*; **Deng, F.*** Solid-state NMR for metal-containing zeolites: from active site to reaction mechanism *Front. Chem. Sci. Eng.* **2020**, 14:159-187.
68. Yang, L.X.; Feng, N.D.*; Wang, Q.; Chu,Y.Y.; Xu, J.; **Deng, F.*** Surface water loading on titanium dioxide modulates photocatalytic water-splitting *Cell Rep. Phys. Sci.* **2020**, 1: 100013.
69. Tang, J.; Li, S.H.*; Chu, Y.Y.; Xiao, Y.Q.; Xu, J.; **Deng, F.*** Solid-state NMR studies of the acidity of functionalized metal-organic framework UiO-66 materials *Magn. Reson. Chem.* **2020**, 58:1091-1098.
70. Liu, X.L.; Wang, Q.; Wang, C.; Xu, J.*; **Deng, F.*** Hydrogen-bond induced crystallization of silicalite-1 zeolite as revealed by solid-state NMR spectroscopy *Acta Phys. -Chim. Sin.* **2020**, 36, 1905035.
71. Xiao, Y.Q.; Li, S.H.*; Tang, J.; Xu, J.; **Deng, F.*** Solid-state NMR spectroscopy studies on structure, dynamics and host-guest interaction in metal-organic framework materials *Chem. J. Chinese Universities-Chinese* **2020**, 41: 204-220.
72. Mao, C.L.; Wang, J.X.; Zou,Y.J.; Qi, G.D.; Loh, J.; Zhang,T.; Xia, M.; Xu, J.; **Deng, F**.; Ghoussoub, M.; Kherani, N. P.; Wang, L.; Shang, H.; Li, M.Q.; Li, J.; Liu, X.; Ai, Z.H.; Ozin, G.A.*; Zhao, J.C.; Zhang, L.Z.* Hydrogen spillover to oxygen vacancy of $TiO_{2-x}H_y$/Fe: breaking the scaling relationship of ammonia synthesis *J. Am. Chem. Soc.* **2020**, 142: 17403-174128.
73. Yang, J.Y.; Peng, M.; Ren, G.Q.; Qi, H.F.; Zhou, X.; Xu, J.; **Deng, F**.; Chen, Z.Q.; Zhang, J.C.; Liu, K.P.; Pan, X.L.; Liu, W.; Su, Y.; Li, W.Z.*; Qiao, B.T.*; Ma, D.*; Zhang, T. A hydrothermally stable irreducible oxide-modified Pd/$MgAl_2O_4$ catalyst for methane combustion *Angew. Chem. Int. Ed.* **2020**, 59:18522-18526.
74. Chu, Y. Y.; Luo, A. Y.; Wang, C.; **Deng, F.*** Origin of high selectivity of dimethyl ether carbonylation in the 8-membered ring channel of mordenite zeolite *J. Phys. Chem. C*. **2019**, 123: 15503-15512.
75. Tang, J.; Li, S. H.*; Chu, Y.Y.; Xiao, Y.Q.; Xu, J.; **Deng, F.*** Host-guest interaction between methanol and metal-organic framework $Cu_{3-x}Zn_x(btc)_2$ as revealed by solid-state NMR *J. Phys. Chem. C* **2019**, 123: 24062-24070.
76. Xu, J. *; Wang, Q. ; **Deng, F.*** Metal active sites and their catalytic functions in zeolites: insights from solid-state NMR spectroscopy *Acc. Chem. Res.* **2019**, 52: 2179-2189.

77. Zhou, X.; Wang, C.; Chu, Y.Y.; Xu, J.*; Wang, Q.; Qi, G. D.; Zhao, X. L.; Feng, N. D.; **Deng, F.*** Observation of an oxonium ion intermediate in ethanol dehydration to ethene on zeolite *Nat. Commun.* **2019**, 10:1961.
78. Xin, S.H.; Wang, Q.*; Xu, J.; Chu, Y.Y.; Wang, P. F.; Feng, N.D.; Qi, G.D.; Trebosc, J.; Lafon, O.; Fan, W.B.; **Deng, F.*** The acidic nature of "NMR-invisible" tri-coordinated framework aluminum species in zeolites *Chem. Sci.* **2019**, 10:10159-10169.
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Invited Review Articles:

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2. Zheng, M.J.; Chu,Y.Y.; Wang, Q.*; Wang, Y.X.; Xu, J.; **Deng, F.*** Advanced solid-state NMR spectroscopy and its applications in zeolite chemistry *Prog. Nucl. Magn. Reson. Spectrosc.* **2024**, 140-141: 1-41.
3. Wang, W.Y.; Wang, Q.; Xu, J.*; **Deng, F.** Understanding heterogeneous catalytic hydrogenation by parahydrogen-induced polarization NMR *ACS Catal.* **2023**, 13:3501-3519.
4. Wang, W.Y.; Xu, J.*; **Deng, F.*** Recent advances in solid-state NMR of zeolite catalysts *Natl. Sci. Rev.* **2022**, 9: nwac155
5. Qi, G.D.; Wang, Q.; Xu, J.*; **Deng, F.** Solid-state NMR studies of internuclear correlations for characterizing catalytic materials *Chem. Soc. Rev.* **2021**, 50: 8382-8399.
6. Xu, J.*; Wang, Q.; **Deng, F.*** Metal active sites and their catalytic functions in zeolites: insights from solid-state NMR spectroscopy *Acc. Chem. Res.* **2019**, 52: 2179-2189
7. Zheng, A.M.*; Liu, S.B.*; **Deng, F.*** ^{31}P NMR chemical shifts of phosphorus probes as reliable and practical acidity scales for solid and liquid catalysts *Chem. Rev.* **2017**, 117: 12475-12531.
8. Zheng, A.M.; Li, S.H.; Liu, S. B.*; **Deng, F.*** Acidic properties and structure-activity correlations of solid acid catalysts revealed by solid-state NMR spectroscopy *Acc. Chem. Res.* **2016**, 49: 655-663.
9. Li, S. H.; Lafon, O.; Wang, W.Y.; Wang, Q.; Wang, X.X.; Li, Y.; Xu, J.*; **Deng, F.** Recent advances of solid-state NMR spectroscopy for microporous materials *Adv. Mater.* **2020**, 32, 2002879.
10. Marchetti, A.; Chen, J.; Pang, Z. F.; Li, S. H.; Ling, D. H.; **Deng, F.***; Kong, X. Q.* Understanding surface and interfacial chemistry in functional nanomaterials via solid-state NMR *Adv. Mater.* **2017**, 29, 1605895
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14. Wang, C.; Xu, J.*; **Deng, F.*** Mechanism of methanol-to-hydrocarbon reaction over zeolites: a solid-state NMR perspective *ChemCatChem* **2020**, 12, 965-980.

15. Xiao, Y.Q.; Li, S.H.*; Xu, J.; **Deng, F.*** Solid-state NMR studies of host–guest chemistry in metal-organic frameworks *Current Opinion in Colloid & Interface Science* **2022**, 61:101633

16. Zhao, X.L.; Xu, J.*; **Deng, F.*** Solid-state NMR for metal-containing zeolites: from active site to reaction mechanism *Front. Chem. Sci. Eng.* **2020**, 14:159-187.

17. Li, S.H.; **Deng, F.** Recent advances of solid-state NMR studies on zeolites *Annual Reports on NMR Spectroscopy*, **2013**, 78: 1-45.

18. Zheng, A. M.; **Deng, F.**; Liu S. B. Acidity characterization of solid acid catalysts by solid-state ^{31}P NMR of adsorbed phosphorus containing probe molecules *Annual Reports on NMR Spectroscopy*, **2014**, 81: 47-108.

19. Feng, N.D.; Xu, J.*; **Deng, F.*** Solid-state NMR of active sites in TiO2 photocatalysis: a critical review *Chem Synth.* **2024**, 4:43.

20. Zheng, A.M.; Huang, S.J.; Wang, Q.; Zhang, H.L.; **Deng, F.***; Liu, S.B.* Progress in development and application of solid-state NMR for solid acid catalysis. *Chin. J. Catal.* **2013**, 34: 436-491.

21. Li, S. H.; Li, J.; Zheng, A. M.; **Deng, F.*** Solid-state NMR characterization of the structure and catalytic reaction mechanism of solid acid catalysts *Acta Phys.-Chim. Sin.* **2017**, 33: 270-282.

22. Li, S.H. ; Zhou, L.; Zheng, A.M.; **Deng, F.*** Recent advances in solid-state NMR characterization of zeolites *Chin. J. Catal.* **2015**, 36 :789-796.

23. Qi, G.D.; Ye, X.D.; Xu, J.*; **Deng, F.*** Progress in NMR studies of carbohydrates conversion on zeolites *Chem. J. Chinese Universities-Chinese* **2021**, 42:148-164.

24. Xiao, Y.Q.; Li, S.H.*; Tang, J.; Xu, J.; **Deng, F.*** Solid-state NMR spectroscopy studies on structure, dynamics and host-guest interaction in metal-organic framework materials *Chem. J. Chinese Universities-Chinese* **2020**, 41: 204-220

25. Yu, Z. W.; Zheng, A. M.; Wang, Q.; **Deng, F.*** Application of two-dimensional double quantum magic angle spinning NMR to solid functional materials *Chem. J. Chinese Universities-Chinese* **2011**, 32: 471-484.

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Book

1. Xu, J.; Wang, Q.; Li, S. H.; **Deng, F.** *Solid-State NMR in Zeolite Catalysis*, Lecture Notes in Chemistry 103, Springer Nature Singapore Pte Ltd. **2019**, page 1-260.

Book Chapter

1. Qi, G.D.; Xu, J.; **Deng, F.** Spectroscopic Characterization of Heteroatom-Containing Zeolites *Micro-Mesoporous Metallosilicates (Synthesis, Characterization and Catalytic applications)*, P. Wu and H. Xu (ed.), Wiley-VCH GmbH **2024**, page 217-252.
2. Zheng, A.M.; Li, S.H.; **Deng, F.** Solid-state NMR characterization of acidity of solid catalysts, *Modern Magnetic Resonance*, Springer, Graham A. Webb (ed.) **2017**, 1-23.
3. Li, S.H.; **Deng, F.** Solid-state NMR studies of zeolites, *Zeolites in Sustainable Chemistry, Green Chemistry and Sustainable Technology*, F.S. Xiao, X. Meng (ed), Springer-Verlag Berlin Heidelberg **2015**, page 231-268.
4. **Deng, F.**; Yang, J.; Ye, C.H. Solid-state NMR characterization of solid surface of heterogeneous catalysts *Modern Magnetic Resonance*, Graham A. Webb (ed.) **2005**, 205-211.

Selected Presentations:

1. ^{1}H spin diffusion of organic molecules adsorbed on porous solids, Oral presentation, Proceedings of International 4th Beijing Conference and Exhibition on Instrumental Analysis, October 18-24, **1991**, Beijing, China
2. Adsorption of Na^{+} to γ-alumina studied by ^{23}Na and ^{27}Al solid-state NMR spectroscopy, Oral presentation, Proceedings of International 5th Beijing Conference and Exhibition on Instrumental Analysis, October 9-12, **1993**, Beijing, China
3. Solid-state NMR investigation of acid sites in dealuminated H-ZSM-5 zeolite, Short oral presentation, Proceedings of the Third International Meeting on Recent Advances in MR Applications to Porous Media, September 3-6, **1995**, Louvian-La-Neuve, Belgium
4. ^{1}H MAS and $^{1}H\{^{23}Na\}$ double resonance NMR studies on the modification of surface hydroxyls of γ-alumina by sodium, Plenary lecture, the 9th Chinese National Magnetic Resonance Conferenece, September, 15-19, **1996**, Chengde, China
5. Solid-state NMR studies of molecular sieves and catalytic reactions, Invited lecture, Proceedings of International 8th Beijing Conference and Exhibition on Instrumental Analysis, October 25-28, **1999**, Beijing, China
6. Solid-state NMR studies of zeolite catalysts, Invited lecture for Wang T. C. Award for Magnetic Resonance Spectroscopy, the 11th Chinese National Magnetic Resonance Conferenece, October15-18, **2000**, Nanjing, China
7. Using trimethylphosphine as a probe molecule to study the acid sites in Al-MCM-41materials by solid-state NMR spectroscopy, Oral presentation, International Symposium on Solid State Chemistry in China, August 9-12, **2002**, Changchun, China
8. Solid-state NMR studies of ordered mesoporous materials. Oral presentation, Proceedings of International 10th Beijing Conference and Exhibition on Instrumental Analysis, October 13-16, **2003**, Beijing, China
9. Surface acidity of BF_3/Al_2O_3 catalyst as studied by solid-state NMR and theoretical calculation. Invited lecture, the 1st Asia-Pacific NMR Symposium, November 9-11, **2005**, Yokohama, Japan
10. Solid-state NMR spectroscopy and its application to heterogeneous catalysts, Invited lecture, the 1st Sino-French Workshop on Solid-state NMR Spectroscopy, October 17-21, **2006**, Wuhan, China

11. Solid-state NMR studies on solid acid catalysts, Plenary lecture, the 14th Chinese National Magnetic Resonance Conferenece, October 11-13, **2006**, Xi'an, China.
12. A Combined Solid-State NMR Spectroscopy and Theoretical Calculation Study of Bronsted/Lewis Acid Synergy in Dealuminated Y Zeolite. Invited lecture, the 16th ISMAR (International Society for Magnetic Resonance) Conference, October 14-19, **2007**, Kenting, Taiwan, China
13.Two-dimensional ^{1}H-^{1}H Double-quantum Magic Angle Spinning NMR Studies of Bronsted/Lewis Acid Synergy in zeolites. Invited lecture, the 1st Cross-Strait Magnetic Resonance Symposium, Oct.10 - 12, **2007**, Taibei, China.

14. Solid-state NMR spectroscopy: principle and application. Invited lecture, Advanced Class of Modern Characterization Techniques for Catalysis, October 26-30, **2007**, Dalian, China.
15. Solid-state NMR spectroscopy. Invited lecture, Bruker Workshop on Solid-state NMR spectroscopy, April 4-6, **2008**, Beijing, China.
16. Brønsted/Lewis Acid Synergy in Microporous Zeolites Studied by Solid-State NMR Spectroscopy and Theoretical Calculation. Invited lecture, the 13th Asian Chemical Conference, September 14-16, **2009**, Shanghai, China.
17. Solid-state NMR studies of spatial proximity between different acid sites in zeolites, Keynote lecture, the 15th Chinese National Conference on Zeolites, October 12-15, **2009**, Luoyang, China
18. Spatial Proximity of Acid Sites in Microporous Zeolites as Studied by ^{1}H-^{1}H and ^{27}Al-^{27}Al DQ MAS Solid-state NMR Spectroscopy. Invited lecture, Joint EUROMAR **2010** and 17th ISMAR (International Society for Magnetic Resonance) conference, July 4-9, **2010**, Florence, Italy.
19. Surface acidity of solid acid catalysts studied by solid-state NMR spectroscopy and theoretical DFT calculations. Invited lecture, the 240th ACS National Meeting, August 22-27, **2010**, Boston, USA.

20. Solid-state NMR characterization of heterogeneous catalysts. Invited lecture, the 2nd Sino-French Workshop on Solid-state NMR Spectroscopy, November 1-3, **2010**, Wuhan, China
21. Two-dimensional ^{1}H-^{1}H and ^{27}Al-^{27}Al DQ MAS Solid-state NMR Studies of Spatial Proximity of Acid Sites in Zeolites. Invited lecture, the 4th Asia-Pacific NMR Symposium, October 16-19, **2011**, Beijing, China
22. Solid-state NMR and DFT calculation studies of zeolites. Keynote lecture, the 16th Chinese National Conference on Zeolites, October 14-17, **2011**, Beijing, China
23. Bronsted/Lewis Acid Synergy in Zeolites Studied by Two-dimensional ^{1}H-^{1}H and ^{27}Al-^{27}Al DQ MAS Solid-state NMR Spectroscopy. Invited lecture, Frontiers Seminar Series, Pacific Northwest National Laboratory, April 23, **2011**, Richland, Washington, USA.
24. Solid-state NMR Studies of Heterogeneous Catalysts, Invited lecture, the 6th Pacific Basin Conference on Adsorption Science and Technology, May 20-23, **2012**, Taibai, China.
25. Two-dimensional ^{1}H-^{1}H and ^{27}Al-^{27}Al DQ MAS Solid-state NMR Studies of Zeolites, Invited lecture, the 41th Korean Magnetic Resonance Society Conference, June 28-30, **2012**, Jeju Island, Korea.

26. Methane activation and conversion over Zn modified ZSM-5 Zeolites studied by Solid-state NMR spectroscopy and DFT Calculation. Invited lecture, the 6th Asia-Pacific Congress on Catalysis, October 14-17, **2013**, Taibei, China.

27. Solid-state NMR studies of heterogeneous catalysts and catalytic reactions. Invited lecture, the 3nd Sino-French Workshop on Solid-state NMR Spectroscopy, May 9-11, **2013**, Dalian, China

28. Solid acid catalysts and catalytic reactions studied by solid-state NMR and DFT calculations. Keynote lecture, the 17th Chinese National Conference on Zeolites, Aug 29- Sept 2, **2013**, Yinchuan, China.

29. Solid-state NMR and theoretical DFT calculation studies on solid acid catalysts and related catalytic reactions. Invited lecture, the 55th ENC (Experimental Nuclear Magnetic Resonance Conference), March 23-28, **2014**, Boston, USA.

30. Solid-state NMR and theoretical DFT calculation studies on solid acid catalysts and related catalytic reactions. Invited lecture, the 29th National Conference of Chinese Chemical Society (porous functional materials section), August 4-7, **2014**, Beijing, China

31. Solid acid catalysts and related catalytic reactions studied by solid-state NMR spectroscopy and DFT calculations. Keynote lecture, the 17th National Congress on Catalysis of China, October 13-17, **2014**, Hanzhou, China

32. Solid-state NMR and theoretical DFT calculation studies on solid acid catalysts and catalytic reactions. Plenary lecture, 18th Chinese National Conference on Zeolites, October 25-28, **2015**, Shanghai, China.

33. Solid-state NMR studies on methane activation and conversion over Zn-modified ZSM-5 Zeolites. Invited lecture, the 19th ISMAR (International Society for Magnetic Resonance) Conference, August 16-21, **2015**, Shanghai, China.

34. Methane and CO activation and conversion over Zn-modified ZSM-5 zeolites studied by solid-state NMR and ESR specstroscopy, Invited lecture, the 16th International Congress on Catalysis, July 3-8, **2016**, Beijing, China

35. Solid-state NMR studies of solid acid catalysts and related catalytic reactions. Invited lecture, 2016 Lanzhou International Workshop on Solid-state Nuclear Magnetic Resonance, August 19-21, **2016**, Lanzhou, China

36. Solid-state NMR studies of zeolite catalysis. Invited lecture, the 7th Cross-Strait Magnetic Resonance Symposium, October 30 - Nov. 1, **2018**, Taibei, China.

37. The stuctures and catalytic reaction mechanisms of zeolites studied by solid-state NMR spectroscopy. Keynote lecture, the 19th National Congress on Catalysis of China, October 13-17, **2019**, Chongqing, China

38. Solid-state NMR studies of heterogenous catalysis in zeolites. Keynote lecture, the 21st Chinese National Conference on Zeolites, September 27-30, **2021**, Qingdao, China

39. Zeolite catalysis studied by solid-state NMR spectrocopy, Invited online lecture, Chinese Analytical Forum, Nano Catalysis Section, June 10, **2022**

40. Solid-state NMR studies of zeolite chemistry, Invited lecture, the 2nd Annual Symposium of Pudong NMR Forum, November 11, **2023**, Shanghai, China