

邓 风 中国科学院精密测量科学与技术创新研究院（原中科院武汉物理与数学所）研究员、博士生导师、国家杰出基金获得者，曾任波谱与原子分子物理国家重点实验室副主任（2005-2015）、主任（2016-2023）、国家大型科学仪器中心 - 武汉磁共振中心常务副主任（2008-2018）。

1988 年获成都科技大学（现四川大学）化学系物理化学专业学士学位；1991 年和 1996 年获中科院武汉物理所核磁共振专业硕士和博士学位，师从叶朝辉院士和杜有如研究员；1997-1998 年美国 Texas A&M 大学化学系博士后，合作导师为 James F. Haw 教授。1999 年被中科院武汉物理与数学所聘为研究员和博士生导师。2000 年获“王天眷波谱学奖”和“国务院政府特殊津贴”，2004 年获国家杰出青年基金（物理化学）资助，2009 年入选“新世纪百千万人才工程”国家级人选和中科院“百人计划”。现任国际磁共振学会（ISMAR）委员会委员、中国物理学会波谱专业委员会委员、中国化学会物理化学委员会/催化委员会/分子筛委员会委员，Solid State Nucl Magn Reson、Magn Reson Lett、《物理化学学报》、《高等学校化学学报》和《波谱学杂志》等期刊编委。长期从事固体 NMR 谱学方法及其在多相催化和材料化学中的应用研究工作，在 Science、Nat Catal、Nat Commun、Chem Rev、Chem Roc 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、Solid State NMR、Magn Reson Chem、Prog Nucl Magn Reson Spectrosc 等刊物上发表 SCI 论文 400 余篇，被他引 19000 余次 (web of science)；出版英文专著 1 部 (*Solid-State NMR in Zeolite Catalysis*, Springer, 2019)。

Selected Publications:

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 Al³⁺ Sites for Ethanol Dehydration on γ -Al₂O₃ 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.
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Invited Review Articles:

1. 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
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.*** ³¹P NMR chemical shifts of phosphorus probes as reliable and practical acidity scales for solid and liquid catalysis *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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13. 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.
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 ³¹P 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.
26. Yu, Z.W.; Zheng, A.M.; Wang, Q.; Huang, S.-J.; **Deng, F.***; Liu, S.B.* Acidity characterization of solid acid catalysts by solid-state NMR spectroscopy: a review on recent progresses. *Chin. J. Magn. Reson.* **2010**, 27: 485-515.

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. ¹H 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 ²³Na and ²⁷Al 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. ^1H MAS and $^1\text{H}\{^{23}\text{Na}\}$ double resonance NMR studies on the modification of surface hydroxyls of γ -alumina by sodium, Plenary lecture, the 9th Chinese National Magnetic Resonance Conference, 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 Conference, October 15-18, **2000**, Nanjing, China
7. Using trimethylphosphine as a probe molecule to study the acid sites in Al-MCM-41 materials 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 $\text{BF}_3/\text{Al}_2\text{O}_3$ 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 Conference, 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 ^1H - ^1H 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**, Taipei, 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. Bronsted/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 ^1H - ^1H 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 ^1H - ^1H 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 ^1H - ^1H 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 ^1H - ^1H 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**, Taipei, China.
27. Solid-state NMR studies of heterogeneous catalysts and catalytic reactions. Invited lecture, the 3rd 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 spectroscopy, 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**, Taipei, China.
37. The structures 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 spectroscopy, 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