

## BIO-DATA OF PROF. (DR.) C.L. KHETRAPAL

### 1. Name, Address, E-Mail, Phone, Fax:

C.L. Khetrpal, Distinguished Professor  
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### 2. Date of Birth

August 25, 1937

### 3. Academic Qualifications

HighSchool (1953) I Class (72.6%),  
U.P. Board of Education, Allahabad.

Intermediate (1955) I Class with II Rank, U.P.  
Board of Education (80%).

B.Sc. (1957) I Class, Allahabad University,  
Awardee of K.P. Chatterjee Medal for standing  
First in Chemistry.

M.Sc. (1959) I Class I Rank (Inorganic  
Chemistry), Allahabad University, awarded  
K.P. Chatterjee Medal for standing I.

Ph.D. (1965) Bombay University (Physical  
Chemistry).

### 4. Posts held and

#### Present employment

(1959-1960) – Research Trainee,  
Atomic Energy Atomic  
Establishment Trombay, Bombay (72%).

(1960-1973) – Tata Institute of Fundamental  
Research, Bombay. Last position held: Reader.

(1973-1984) – Raman Research Institute,  
Bangalore, Associate Professor.

(1984-1998) – Indian Institute of Science,  
Bangalore, Professor.

Responsible for setting up and running of the  
Sophisticated Instruments Facility the 1<sup>st</sup>  
National Facility in this field by of India  
(1998-2001) – Vice-Chancellor, Allahabad  
University.

(2001 - 2006) – Distinguished Professor,  
Sanjay Gandhi Postgraduate Institute of  
Medical Sciences (SGPGIMS), Lucknow

(2001-2013) Director, Centre of Biomedical  
Magnetic Resonance, SGPGIMS Campus,  
Lucknow.

(2013-till date) – Distinguished Professor and  
Vice Chairman, CBMR

## 5. Recognitions by Academic Institutions/Professional Associations/Societies

1981	Elected Fellow of the Indian National Science Academy, New Delhi.
1982	Awarded Prestigious S.S. Bhatnagar Award in Chemical Sciences
1983	Key-note Speaker, 8 <sup>th</sup> International Conference on Magn. Reson., Chicago
1984-1994	Member, Governing Council, Internat.Conf. on Magn. Reson. in Biol. Systems
1984	Elected Fellow of the National Academy of Sciences, Allahabad
1984	Scientific Secretary, XI Internat.Conf. on Magn. Reson. in Biol. Systems
1985-	Member, Management Committee, High Field NMR Facility, TIFR, Bombay
1986	Plenary Speaker, 9 <sup>th</sup> Internat. Conf. on Magn. Reson., Rio-de-Janeiro, Brazil
1986-1995	Member, Governing Council, the International Society of Magnetic Resonance
1989-1996, 2001	Member of the Council of the National Academy of Sciences
1990	Awarded Dr. Jagdish Shankar Lecture Award, INSA, Local Chapter, Bombay.
1990	Awarded the prestigious R.K.Asundi Lecture Award (1990) by INSA
1990-1992	Secretary General International Soc.of Magnn. Reson. in Biological Systems
1991	Bawa Kartar Singh Lecture Award, Panjab University, Chandigarh
1992	President, Physical Sciences, Annual Session, National Academy of Sciences
1993	Convener, 63 <sup>rd</sup> Annual Session of the National Academy of Sciences, India.
1994	President, Chemistry Section, Indian Science Congress
1996	Awarded C.V. Raman Award, UGC
1996	Awarded Goyal Prize in Chemical Sciences
1996	Member Internat. Adv. Board, 16 <sup>th</sup> Internat. Liquid Crystal Conference, USA,
1995-1998	Founder President of the National Magnetic Resonance Society, India
1997	Sahstrabudhey Award, Nagpur University
1998	Member,Management Committee, NMR Research Cent. (SIF), IISc, Bangalore.
1998	J.C. Ghosh Lecture Award, Indian Chemical Society
1998-2001	Member, Governing Council, IUCA, Pune
1998-2001	Member, Governing Council, Nuclear Science Centre, New Delhi
1998-2001	Member, Governing Council IUC, Indore
1999-2000	Vice president, National Academy of Sciences, Allahabad, India
2001-2004	Member SERC, DST, New Delhi
2001-2004	Member, Governing Body, CSIR
2001-2004	Member, CSIR Society, New Delhi
2001	S.N. Ghosh Lecture Awardee, Allahabad University
2002	Awarded P.C. Ray memorial medal, the Indian Science Congress Association
2003-2013	Member, Governing Council, Centre for Liquid Crystal Research, Bangalore
2004-	Vice Chairman, Chemical Sciences, RAB, CSIR, New Delhi
2005	N.R. Dhar Memorial Lecture Award, the National Academy of Sciences, India,
2005	Life Time Achievement Award, The Indian Chemical Society
2006	Member, International Advisory Board, 16 <sup>th</sup> Triennial Conference of the International Society of Magnetic Resonance, 2007
2008-2011	Visitor's Nominee, Governing Body, SGPGIMS, Lucknow
2008	U.P. Ratan, State Intellectuals' Honour
2008	LMA Creativity and innovation Award
2008	MS University, Baroda, K.G. Naik Medal 2004
2009	Elected Fellow, International Society of Magnetic Resonance
2013	Visitor's Nominee, Court of University of Hyderabad
2013	Life Time Achievement: The Indian Society of Chemists and Biologists
2013	Vigyan Vibhushan: U.P. Science Congress
2013	D.Litt. ( <i>h.c.</i> ), Ayush and Health Sciences University, Raipur
2014	CMAI "Excellence in Education Award"
2014-2017	Member Governing Body, Biotech Park, Lucknow

He has also been a member of the Board of Studies in Chemistry, Bangalore University; member of Board of Studies in Physics, North-Eastern Hill

University, Shillong and an Honorary Expert Member of the Faculty of Science, BHU, Varanasi.

#### **6. Membership of the Editorial Boards:**

Member of the International Editorial Board of NMR-Basic Principles and Progress (Springer-Verlag), West Germany. Member of the International Board of Reporters of Specialists Periodical Reports on NMR published by the Chemical Society (The Royal Society of Chemistry), London. Member of the Editorial Board of Indian Journal of Chemistry and the Proceedings of the National Academy of Sciences.

#### **7. Science Citation Classic:**

Publications 42 and 34 have been selected as the Citation Classics during 1983 and 1990, respectively.

#### **8. Research Papers and Articles Published:** List enclosed.

#### **9. Presidential Addresses:**

1. Physical Sciences, 62<sup>nd</sup> Annual Session of National Academy of Sciences, India, 1992.
2. Chemistry Section, Indian Science Congress, 1994.

#### **10. Books, Monographs and Reviews:**

1. NMR studies of molecules oriented in the nematic phase of liquid crystals. P.Diehl and C.L. Khetrpal, NMR-Basic Principles and Progress, Vol.1, 1969. Published by Springer-Verlag, West Germany.
2. NMR studies in lyotropic liquid crystals. C.L. Khetrpal, A.C. Kunwar, A.S.Tracey and P.Diehl, NMR-Basic Principles and Progress, Vol.9, 1975. Springer-Verlag, West Germany.
3. NMR studies of molecules oriented in thermotropic liquid crystals. C.L. Khetrpal and A.C. Kunwar, Advances in Magnetic Resonance, Vol.9, 1977. Academic Press, New York, USA.
4. Biomembranes: Proceedings of the National Symposium. Edited by S.V. Talekar, P. Balaram, S.K.Poffer and C.L. Khetrpal, Phoenix Press, Bangalore, 1978.
5. Specialist Periodical Report. NMR: Oriented Molecules, Vol.8, 1979. C.L.Khetrpal and A.C. Kunwar, The Chemical Society, London.
6. Specialist Periodical Reports, NMR: Oriented Molecules, Vol.9, C.L.Khetrpal and A.C.Kunwar, The Royal Society of Chemistry, England, 1980.
7. Specialist Periodical Reports, NMR: Oriented Molecules, Vol.11, C.L.Khetrpal and A.C.Kunwar, The Royal Society of Chemistry, England, 1982.
8. NMR Spectroscopy of Oriented Molecules. C.L.Khetrpal and A.C.Kunwar, Advances in Liquid Crystals, Vol.6, (1977), Academic Press, New York.
9. Specialist Periodical Reports, NMR: Oriented Molecules, Vol.13, The Royal Society of Chemistry, England, 1984.
10. Magnetic Resonance in Biology and Medicine. Tata McGraw Hill, New Delhi, 1984. Editors: G.Govil, C.L.Khetrpal and Anil Saran (1985).
11. Specialist Periodical Reports, NMR: Oriented Molecules, Vol.15, C.L.Khetrpal and K.V.Ramanathan, The Royal Society of Chemistry, England, (1986).

12. Specialist Periodical Reports, NMR: Oriented Molecules, Vol.17, C.L.Khetrapal, B.S.Arun Kumar and S. Ragothama, The Royal Society of Chemistry, England, (1988).
13. Specialist Periodical Reports, NMR: Oriented Molecules, Vol.19, C.L.Khetrapal, K.V. Ramanathan and A.C. Kunwar, The Royal Society of Chemistry, England, 1990.
14. Liquid Crystals: Spectroscopy Applications, C.L.Khetrapal, R.G. Weiss and A.C. Kunwar, World Scientific Publishing Co. Inc. London, England, Vol.2, 1990.
15. NMR of Oriented Molecules, C.L.Khetrapal and E.D. Becker, Magn .Reson .Review. 1992.
16. Specialist Periodical Reports: Vol.21, NMR: Oriented Molecules, C.L.Khetrapal and K.V.Ramanathan, The Royal Society of Chemistry, England, 1992.
17. Magnetic Resonance - Current Trends, Editors: C.L.Khetrapal and G.Govil, Narosa-Springer Verlag (1991).
18. Facets in Coordination Chemistry, World Scientific Publishing Co. 1993.
19. Specialist Periodical Reports: NMR: Oriented Molecules, C.L. Khetrapal and K.V. Ramanathan, The Royal Society of Chemistry, England, Vol.23, (1994).
20. Specialist Periodical Reports: NMR: Oriented Molecules, C.L.Khetrapal and K.V. Ramanathan, The Royal Society of Chemistry, England, Vol.25, (1996).
21. 50 years of NMR. C.L.Khetrapal, Editor, The National Academy of Sciences, India, 1996, Vol.66.
22. Specialist Periodical Reports: NMR: Oriented Molecules, C.L. Khetrapal and K.V. Ramanathan The Royal Society of Chemistry, England, Vol.27, (1998).
23. Specialists Periodical Reports: NMR: Oriented Molecules, C.L.Khetrapal, K.V. Ramanathan, G.A.Nagana Gowda  
The Royal Society of Chemistry, England, Vol. 29. (2000).
24. Specialists Periodical Reports: NMR: Oriented Molecules  
K.V. Ramanathan, G.A. Nagana Gowda, and C.L. Khetrapal  
Royal Society of Chemistry, England, Vol. **31**, p. 464 (2002)
25. NMR of partially aligned solutes with emphasis on structure determination:  
Current Status-Contribution in a multi-author book  
C.L. Khetrapal and G.A. Nagana Gowda,  
Publishers Kluwer Academic, The Netherlands, 2003
26. Oriented Molecules: in 'Nuclear Magnetic Resonance'  
K.V.Ramanathan, G.A.Nagana Gowda and C.L. Khetrapal,  
Ed. G.A.Webb, (Specialist Periodical Reports).  
The Royal Society of Chemistry, London, **33**, 497-530 (2004).
27. Specialists Periodical Reports: NMR: Oriented Molecules  
K.V. Ramanathan, G.A. Nagana Gowda, and C.L. Khetrapal  
The Royal Society of Chemistry, England, **35**, 486-532 (2006)
28. "Oriented molecules": in 'Nuclear Magnetic Resonance' K.V.Ramanathan,  
Uday R. Prabhu, and C.L. Khetrapal, Ed. G.A. Webb, (Specialists  
Periodical Reports). The Royal Society of Chemistry, London, (In the  
Press) (2008)
29. "Oriented molecules": in 'Nuclear Magnetic Resonance' K.V.Ramanathan,  
N.P. Lobo, and C.L. Khetrapal, Ed. G.A. Webb, (Specialists Periodical Reports).

The Royal Society of Chemistry, London, (2010)

30. "Future Directions of Magnetic Resonance" C.L. Khetrapal, Anil Kumar and K.V. Ramanathan (Eds), Springer, 2009; **Reprinted in 2011**

## 11. PUBLICATIONS in Journals

1. High resolution Proton Magnetic Resonance spectrum of coumarin  
G. Govil, C.R. Kanekar, C.L. Khetrapal and Y.P. Virmani  
Curr. Sci., **30**, 313 (1961)
2. Proton Magnetic Resonance in sesamins and asarinins  
G. Govil, C.R. Kanekar and C.L. Khetrapal  
Curr. Sci., **30**, 252 (1961)
3. High resolution NMR spectra of some trisubstituted benzenes  
S.S. Dharmatti, G. Govil, C.R. Kanekar, C.L. Khetrapal and Y.P. Virmani  
Proc. Ind. Acad. Sci., **54**, 331(1961)
4. Proton Magnetic Resonance in coumarins  
S.S. Dharmatti, G. Govil, C.R. Kanekar, C.L.Khetrapal and Y.P. Virmani  
Proc. Ind. Acad. Sci., **56**, 17 (1962).
5. Para proton-fluorine spin-spin couplings in flurobenzenes  
S.S. Dharmatti, M.M. Dhingra, G. Govil and C.L.Khetrapal  
Curr. Sci., **31**, 414 (1962)
6. NMR of thiachromans and related compounds  
M.M. Dhingra, G. Govil, C.L.Khetrapal and V.M. Vaidya  
Tetrahedron Lett., **8**, 497 (1963)
7. Identification and structure determination of some organic compounds  
S.S. Dharmatti, M.M. Dhingra, G. Govil and C.L.Khetrapal  
Spectroscopy and Allied Problems, B.H.U. (India), p. 217 (1963)
8. NMR of five-spin systems II: The spectrum of m- fluoronitrobenzene  
G.Govil, C.L. Khetrapal, and Y.P. Virmani  
Proc. Ind. Acad. Sci., **61**, 80 (1965)
9. NMR of five-spin systems III: The spectrum of allyl iodide  
S.S. Dharmatti, M.M. Dhingra, G. Govil and C.L.Khetrapal  
Bull. National Institute of Science of India, **30**, 9 (1965)
10. Intra-molecular hydrogen bonding in 5-hydroxy chromones  
G. Govil and C.L.Khetrapal  
Curr. Sci., **34**, 116 (1965)
11. Proton Magnetic Resonance studies of the association of amino methyl pyridines  
M.M. Dhingra, G. Govil, C.L.Khetrapal and K. Venkata Ramiah  
Proc. Ind. Acad. Sci., **62**, 90 (1965)
12. Proton spin- spin interactions in m-di-substituted benzenes  
S.S. Dharmatti, G. Govil, C.R. Kanekar, C.L. Khetrapal and Y.P.Virmani

- Proc. Ind. Acad. Sci., **63**, 9 (1965)
13. Substitution and solvent effects on  $C^{13}$ - $F^{19}$  coupling constants  
M.M. Dhingra, G. Govil and C.L.Khetrapal  
Proc. Ind. Acad. Sci., **64**, 91 (1966)
  14. Proton Magnetic Resonance in the pyrone ring of coumarin  
C.R. Kanekar and C.L.Khetrapal  
Curr. Sci., **35**, 459 (1966)
  15. Estimation of aromaticity by NMR dilution shifts  
C.R. Kanekar, G. Govil, C.L.Khetrapal and M.M. Dhingra  
Proc. Ind. Acad. Sci., **64**, 315 (1966)
  16. Resonance in the pyrone ring of chromone  
G. Govil and C.L.Khetrapal  
Curr. Sci., **35**, 564 (1966)
  17. Aromaticities of monosubstituted benzenes and thiophenes  
M.M. Dhingra, G. Govil, C.R. Kanekar and C.L.Khetrapal  
Proc. Ind. Acad. Sci., **65**, 202 (1967)
  18. Solvent effects on proton chemical shifts in thiophenes  
C.R. Kanekar, G.Govil, C.L.Khetrapal and M.M. Dhingra  
Proc. Ind. Acad. Sci., **65**, 195 (1967)
  19. Self-association in aromatic thiols  
C.R. Kanekar, G. Govil, C.L. Khetrapal and M.M. Dhingra  
Proc. Ind. Acad. Sci., **65**, 256 (1967)
  20. NMR studies of solvent-solute interactions of OH, SH and CH protons in dimethylformamide and dimethylacetamide  
C.R. Kanekar, C.L. Khetrapal, K. Vankata Ramiah and C.A. Indira Chary  
Proc. Ind. Acad. Sci., **66**, 189 (1967)
  21. NMR and IR studies of 1,1,1-trifluoroacetones with proton donor solvents  
C.L. Khetrapal, M.M. Dhingra and V.B. Kartha  
Proc. Ind. Acad. Sci., **66**, 196 (1967)
  22. Proton chemical shifts and  $\pi$ -electron densities  
C.R. Kanekar, G.Govil and C.L. Khetrapal  
Proc. Ind. Acad. Sci., **65**, 353 (1967)
  23. Estimation of aromaticity using dilution shifts. An extension of the method for compounds without protons  
C.R. Kanekar and C.L. Khetrapal  
Curr. Sci., **36**, 67 (1967)
  24. Aromaticities of pentafluorobenzenes from NMR  
C.L. Khetrapal and M.M. Dhingra  
Curr. Sci., **36**, 572 (1976)
  25. NMR and IR studies of the interactions of compounds containing OH group with some ethylenes  
C.L. Khetrapal, M.M. Dhingra, K. Venkata Ramiah and P. Usha Bai  
Proc. Ind. Acad. Sci., **67**, 322 (1968)
  26. Temperature, concentration and spinning speed dependence of the NMR spectra of oriented molecules  
P. Diehl and C.L. Khetrapal

- Molec. Phys., **14**, 283 (1968)
27. NMR spectra of pyrazine and p-benzoquinone oriented in a nematic phase  
P. Diehl and C.L. Khetrapal  
Molec. Phys., **14**, 327 (1968)
  28. Proton Magnetic Resonance spectrum of oriented furan in the liquid crystalline nematic phase  
P. Diehl, C.L. Khetrapal and H.P. Kellerhals  
Helv. Chim. Acta., **51**, 529 (1968)
  29. The use of the direct and the moment methods in the analysis of the NMR spectra of oriented molecules  
P. Diehl, C.L. Khetrapal and U. Lienhard  
Molec. Phys., **14**, 465 (1968)
  30. The structure of benzofurazan oxide from Proton Magnetic Resonance in the nematic phase  
P. Diehl and C.L. Khetrapal  
Proc. XV Colloq. Ampere (Grenoble), 1968, p. 251
  31. The NMR spectra of symmetrical meta disubstituted benzenes in a nematic phase at room temperature  
P. Diehl and C.L. Khetrapal  
Molec. Phys., **15**, 633 (1968)
  32. NMR spectra of oriented 4-spin systems with  $C_{2v}$ -symmetry (AA'BB'). The spectrum of thiophene  
P. Diehl, C.L. Khetrapal and U. Lienhard  
Cand. J. Chem., **46**, 2645 (1968)
  33. NMR spectra of symmetrical ortho disubstituted benzenes dissolved in the nematic phase  
P. Diehl and C.L. Khetrapal  
Molec. Phys., **15**, 201 (1968)
  34. The NMR spectrum of pyridine oriented in the nematic phase  
P. Diehl, C.L. Khetrapal and H.P. Kellerhals  
Molec. Phys., **15**, 333 (1968)
  35. Proton Magnetic Resonance in octahedral complexes of Fe (II) and Co (III) with 2,2'-dipyridyl  
C.R. Kanekar, C.L. Khetrapal and S.V. Nipankar  
J. Phys. Chem., **73**, 276 (1969)
  36. Pariser-Parr-Pople calculations in pentafluorobenzenes  
C.L. Khetrapal and D.K. Rai  
Theo. Chim. Acta., **13**, 308 (1969)
  37. The study of the isotopic effects and the determination of the quadrupole coupling constants from the NMR spectra of mono deuterobenzene in the nematic phase  
P. Diehl and C.L. Khetrapal  
Cand. J. Chem., **47**, 1411 (1969)
  38. Deceptive simplicity in NMR spectra of oriented molecules  
P. Diehl, C.L. Khetrapal and U. Lienhard  
Org. Magn. Reson., **1**, 39 (1969)
  39. NMR spectra of partially deuterated acetonitrile dissolved in the nematic phase  
P. Diehl and C.L. Khetrapal  
J. Magn. Reson., **1**, 245 (1969)
  40. The influence of an electric field on the NMR spectra of molecules oriented in the nematic phase

- P. Diehl, C.L.Khetrapal, H.P. Kellerhals, U. Lienhard and W. Neiderberger  
J. Magn. Reson., **1**, 524 (1969)
41. NMR spectrum of phenyl acetylene oriented in the nematic phase  
P. Diehl and C.L.Khetrapal  
Org. Magn. Reson., **1**, 467 (1969)
42. Nuclear Magnetic Resonance studies of solute molecules oriented in the nematic phase  
P. Diehl and C.L.Khetrapal in 'NMR-Basic Principles and Progress' **Vol. 1** (1969)  
Springer-Verlag, New York, Heidelberg, Berlin  
P. Diehl, E. Fluck and R. Kosfeld (Eds.)
43. Liquid Crystals and their applications  
C.L.Khetrapal  
IEEE discussions, 1969
44. Correlation between  $^{13}\text{C}$ - $^{19}\text{F}$  coupling constant in para substituted fluorobenzenes and Hammett's constants  
M.M. Dhingra, G. Govil and C.L.Khetrapal  
Ind. J. Pure. & Appl. Phys., **8**, 671 (1970)
45. NMR spectrum of 2,6-dichlorotoluene oriented in the nematic phase  
P. Diehl, C.L. Khetrapal, W. Niederberger and P. Partington  
J. Magn. Reson., **2**, 405 (1970)
46. Molecular structure of pyrimidine by NMR in the nematic phase  
C.L. Khetrapal, A.V. Patnakar and P. Diehl  
Org. Magn. Reson., **2**, 405 (1970)
47. NMR investigation on ( $\pi$ -benzene) chromium tricarbonyl oriented in a nematic phase. The spectrum of m-chlorobromobenzene  
C.L. Khetrapal, A.C. Kunwar, C.R. Kanekar and P. Diehl  
Molec. Cryst. Liq. Cryst., **12**, 179 (1971)
48. NMR spectrum of unsymmetrical m-disubstituted benzenes oriented in the nematic phase. The spectrum of m-chlorobromobenzenes  
C.L. Khetrapal and A.C. Kunwar  
J. Ind. Chem. Soc., **48**, 649 (1971)
49. NMR investigation on  $\pi$ -Cyclopentadienyl manganese tricarbonyl oriented in the nematic phase  
C.L. Khetrapal, A.C. Kunwar and C.R. Kanekar  
Chem. Phys. Lett., **9**, 437 (1971)
50. The structure of  $\pi$ -methyl cyclopentadienyl manganese tricarbonyl as determined from PMR studies in the nematic phase  
C.L. Khetrapal, A. Saupe, A.C. Kunwar and C.R. Kanekar  
Molec. Phys., **22** 1119 (1971)
51. The structure of 2,1,4-benzothiadiazole from the NMR spectrum in the liquid crystalline phase  
C.L. Khetrapal and A.V. Patankar  
Molec. Cryst. Liq. Cryst., **15**, 367 (1972)
52. NMR spectra of bicyclic compounds oriented in the nematic phase. Part I. The spectrum of quinoxaline  
C.L. Khetrapal and A.C. Kunwar  
Molec. Cryst. Liq. Cryst., **15** 363 (1972)



53. NMR spectra of bicyclic compounds oriented in the nematic phase. Part II. The spectrum of phthalazine  
C.L. Khetrapal, A. Saupe and A.C. Kunwar  
Molec. Cryst. Liq. Cryst., **17**, 121 (1972)
54. PMR spectra of butadiene sulphone in isotropic and liquid crystalline media  
C.L. Khetrapal, A.C. Kunwar and A. Saupe  
J. Magn. Reson., **7**, 18 (1972)
55. Proton Magnetic Resonance studies of methylmercuric halides in isotropic and nematic liquid crystal solutions  
C.L. Khetrapal and A. Saupe  
Molec. Cryst. Liq. Cryst., **19**, 195 (1973)
56. Studies on the structure of  $\gamma$ -picoline by PMR in a nematic solution  
C.L. Khetrapal and A. Saupe  
J. Magn. Reson. **9**, 275 (1973)
57. The ring puckering vibrations in trimethylene oxide and trimethylene sulphide as studied by PMR spectroscopy in a Liquid crystalline medium  
C.L. Khetrapal, A.C. Kunwar and A. Saupe  
Molec. Phys., **25**, 1405 (1973)
58. The conformation of 2,2'-bithiophene as determined from PMR studies in a nematic solvent  
C.L. Khetrapal and A.C. Kunwar  
Molec. Phys., **28**, 441 (1974)
59. NMR spectra of molecules oriented in a lyotropic mesophase. Part II. Spectra of Pyridine and Pyridine-N-Oxide  
C.L. Khetrapal, A.C. Kunwar and A.V. Patankar  
J. Magn. Reson., **15**, 219 (1974)
60. PMR spectra of methyl alcohol dissolved in a nematic solvent with and without a lanthanide shift reagent  
C.L. Khetrapal and A.C. Kunwar  
J. Magn. Reson., **15**, 389 (1974)
61. NMR spectroscopy of molecules dissolved in liquid crystal solvents  
C.L. Khetrapal  
J. Ind. Inst. Sci., **56**, 151 (1974)
62. NMR spectra of molecules oriented in a lyotropic mesophase. Part III. The Spectrum of  $\gamma$ -Hydroxypyridine  
C.L. Khetrapal, A.C. Kunwar and A.V. Patankar  
Org. Magn. Reson., **6**, 556 (1974)
63. NMR spectra of molecules oriented in a lyotropic phase, Part I. The spectra of pyridazine, pyrimidine and pyrazine  
C.L. Khetrapal, A.C. Kunwar and A.V. Patankar  
Pramana Suppl. No. 1, 471 (1975)
64. NMR Spectra of Bicyclic Compounds Oriented in a Nematic Phase, Part III. The spectrum of benzo (b) thiophene  
C.L. Khetrapal, A.C. Kunwar and A. Saupe  
Pramana Suppl. No. 1, 495 (1975)

65. PMR studies on N-methyl formamide oriented in a liquid crystalline nematic phase  
C.L. Khetrapal, A.C. Kunwar and  
K.R.K. Easwaran  
Pramana Suppl. No.1, 483 (1975)
66. Nuclear Magnetic Resonance in lyotropic liquid crystals  
C.L. Khetrapal, A.C. Kunwar, A. S. Tracey and P. Diehl  
NMR- Basic Principles and Progress, Vol. **9** (1975)
67. NMR spectra of  $\pi$ -cyclopentadienyl manganese tricarbonyl in nematic and isotropic solvents  
C.L. Khetrapal, A.C. Kunwar and A. Saupe  
Molec. Cryst. Liq. Cryst., **35**, 215 (1976)
68. NMR spectra of isotopically enriched N-methyl formamide in isotropic and nematic media  
C.L. Khetrapal, A.C. Kunwar and S. Ramaprasad  
Molec. Cryst. Liq. Cryst. Lett., **34**, 123 (1976)
69. The amide planarity as studied by NMR of oriented molecules. The spectrum of N-methyl acetamide  
S. Ramaprasad, H.P. Kellerhals, A.C. Kunwar and C.L. Khetrapal  
Molec. Cryst. Liq. Cryst., **34**, 19 (1976)
70. NMR studies of molecules oriented in thermotropic liquid crystals  
C.L. Khetrapal, A.C. Kunwar  
Adv. Magn. Reson., Vol. **9**, 1977 (Academic Press)
71. Structure and conformation of N, p-chlorophenylmaleimide as studied from NMR in a nematic solvent by proton magnetic resonance  
C.L. Khetrapal, A.C. Kunwar and A. Saupe  
Molec. Cryst. Liq. Cryst., **40**, 193 (1977)
72. Molecular orbital studies on the conformation of N-phenylmaleimide  
G.Govil and C.L. Khetrapal  
Curr. Sci., **46**, 250 (1977)
73. Non-planar distortions in a peptide unit as studied by NMR in liquid crystal solvents  
C.L. Khetrapal and S. Ramaprasad  
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