

Publications Related to Photochemistry within a Capsule
(Initiated at Tulane and mostly done at Uni. Miami)

1. Controlling Photochemistry With Distinct Hydrophobic Nano-Environments
L. S. Kaanumalle, C. L. D. Gibb, B. C. Gibb and V. Ramamurthy, *J. Am. Chem. Soc.*, **2004**, *126*, 14366-14367.
2. A Hydrophobic Nanocapsule Controls the Photophysics of Aromatic Molecules By Suppressing their Favored Solution Pathways
L. S. Kaanumalle, C. L. D. Gibb, B. C. Gibb, V. Ramamurthy, *J. Am. Chem. Soc.*, **2005**, *127*, 3674-3675.
3. Bioinspired-Green-Supramolecular-Nano Photochemistry: Photoproducts Control Through Weak Intermolecular Forces
L. S. Kaanumalle, A. Natarajan, K. Sivasubramanian, R. Kaliappan, M. Pattabiraman and V. Ramamurthy, *Spectrum*, **2006**, *19*, 16-21.
4. Photo-Fries Reaction in Water Made Selective With a Capsule
L. S. Kaanumalle, C. L. D. Gibb, B. Gibb and V. Ramamurthy, *Org. Biomol. Chem.*, **2007**, *5*, 236 - 238
5. Photodimerization of Acenaphthylene Within a Nanocapsule: Excited state lifetime dependent dimer selectivity
L. S. Kaanumalle and V. Ramamurthy, *Chem. Commun.*, **2007**, 1062-1064.
6. Controlling Photoreactions with Restricted Spaces and Weak Intermolecular Forces: Exquisite Selectivity during Oxidation of Olefins by Singlet Oxygen
A. Natarajan, L. S. Kaanumalle, S. Jockusch, C. L. D. Gibb, B. C. Gibb, N. J. Turro, and V. Ramamurthy, *J. Am. Chem. Soc.*, **2007**, *129*, 4132-4133.
7. Making a difference on excited state chemistry by controlling free space within a nanocapsule: Photochemistry of 1-(4-alkylphenyl)-3-phenylpropan-2-ones
A. K. Sundaresan and V. Ramamurthy, *Organic Letters*, **2007**, *9*, 3575-3578.
8. Controlling Photochemical Geometric Isomerization of a Stilbene and Dimerization of a Styrene Using a Confined Reaction Cavity in Water
A. Parthasarathy, L. S. Kaanumalle and V. Ramamurthy, *Organic Letters*, **2007**, *9*, 5059-5062.
9. Temptation of the Excited State Chemistry of α -(*n*-alkyl)dibenzyl ketones: How Guest Packing within a Nanoscale Supramolecular Capsule influences Photochemistry
C. L. D. Gibb, Arun Kumar Sundaresan, V. Ramamurthy and Bruce C. Gibb, *J. Am. Chem. Soc.*, **2008**, *130*, 4069.

10. An EPR and NMR study of supramolecular effects on paramagnetic interaction between a nitroxide incarcerated within a nanocapsule with a nitroxide in bulk aqueous media
J. Y- Chen, N. Jayaraj, S. Jockusch, M. F. Ottaviani, V. Ramamurthy and N. J. Turro, *J. Am. Chem. Soc.*, **2008**, *130*, 7206-7207.
11. Consequences of Controlling Free Space Within a Reaction Cavity With a Remote Alkyl Group: Photochemistry of *para*-Alkyl Dibenzyl Ketones Within an Organic Capsule in Water
Arun Kumar Sundaresan, V. Ramamurthy, *Photochem. Photobiol. Sci.*, (Turro special issue), **2008**, *7*, 1555-1564.
12. Cavitand Octa Acid Forms a Non-Polar Capsuleplex Dependent on the Molecular Size and Hydrophobicity of the Guest
Mintu Porel, Nithyanandhan Jayaraj, Sireesha L. Kaanumalle, Murthy V. S. N. Maddipatla, Anand Parthasarathy and V. Ramamurthy, *Langmuir*, **2009**, *25*, 3473-3481.
13. Chiral Photochemistry within a Confined Space: Diastereoselective Photorearrangements of a Tropolone and a Cyclohexadienone Included in a Synthetic Cavitand
Arun Kumar Sundaresan, Lakshmi S. Kaanumalle, Corinne L. D. Gibb, Bruce C. Gibb, and V. Ramamurthy, *Dalton Transactions*, (Special issue on Supramolecular Photochemistry), **2009**, 4003-4011.
14. Chiral Photochemistry in a Confined Space: Torquoselective Photoelectrocyclization of Pyridones within an Achiral Hydrophobic Capsule
Arun Kumar Sundaresan, C. L. D. Gibb, B. C. Gibb and V. Ramamurthy, *Tetrahedron* (Special issue on Container Compounds), **2009**, *65*, 7277-7288.
15. Nature of Supramolecular Complexes Controlled by the Structure of the Guest Molecules: Formation of Octa-acid Based Based Capsuleplex and Cavitandplex,
N. Jayaraj, Y. Zhao, A. Parthasarathy, M. Porel, R. S. H. Liu and V. Ramamurthy, *Langmuir*, **2009**, *25*, 10575-10586.
16. Activation of fluorescent protein chromophores by encapsulation
A. Baldridge, S. R. Samanta, N. Jayaraj, V. Ramamurthy and L. M. Tolbert, *J. Am. Chem. Soc.*, **2010**, *132*, 1498.
17. Guest rotations within a capsuleplex probed by NMR and EPR techniques
R. Kulasekharan, N. Jayaraj, M. Porel, R. Choudhury, A. K. Sundaresan, A. Parthasarathy, M. F. Ottaviani, S. Jockusch, N. J. Turro and V. Ramamurthy, *Langmuir*, **2010**, *26*, 6943.
18. Electron Spin Polarization Transfer from a Nitroxide Incarcerated within a Nanocapsule to a Nitroxide in the Bulk Aqueous Solution
S. Jockusch, O. Zeika, N. Jayaraj, V. Ramamurthy, N. J. Turro, *J. Phys. Chem. Letters*, **2010**, *1*, 2628-2632.

19. Closed nanocontainer enables thioketones to phosphoresce at room temperature in aqueous solution
N. Jayaraj, M. V. S. N. Maddipatla, R. Prabhakar, S. Jockusch, N. J. Turro and V. Ramamurthy, *J. Phys. Chem. B*, **2010**, *114*, 14320.
20. Suppression of spin-spin coupling in nitroxyl biradicals by supramolecular host-guest interactions
M. Porel, M. F. Ottaviani, S. Jockusch, N. Jayaraj, N. J. Turro and V. Ramamurthy, *Chem. Comm.* **2010**, *46*, 7736-7738.
21. Chemistry in Confined Spaces: High Energy Conformer of a Piperidine Derivative is Favored Within a Water-soluble Capsuleplex
M. Porel, N. Jayaraj, S. Raghothama and V. Ramamurthy, *Organic Letters*, **2010**, *12*, 4544.
22. Steric and Electronic Effects in Capsule-Confined GFP Chromophores
A. Baldridge, S. R. Samanta, N. Jayaraj, V. Ramamurthy and L. M. Tolbert, *J. Am. Chem. Soc.*, **2011**, *133*, 712-715.
23. Restricted rotation due to lack of free space within a capsule translates into product selectivity:
Photochemistry of cyclohexyl phenyl ketones within a water-soluble organic capsule
R. Kulasekharan, R. Choudhury, R. Prabhakar and V. Ramamurthy, *Chem. Comm.* **2011**, *47*, 2841 – 2843.
24. Dynamics of Capsuleplex Formed Between Octaacid and Organic Guest Molecules: Photophysical Techniques Reveal the Opening and Closing of Capsuleplex
N. Jayaraj, S. Jockusch, L. S. Kaanumalle, N. J. Turro and V. Ramamurthy, *Can. J. Chem.*, **2011**, *89*, 203-213. (J. C. Scaiano special issue).
25. Ultrafast singlet-singlet energy transfer between an acceptor electrostatically attached to the walls of an organic capsule and the enclosed donor
S. Gupta, A. Adhikari, A. K. Mandal, K. Bhattacharyya and V. Ramamurthy, *J. Phys. Chem. C*, **2011**, *115*, 9593-9600.
26. Chemistry in Restricted Spaces: Select Photodimerizations in Cages, Cavities and Capsules
V. Ramamurthy and A. Parthasarathy, *Israel. J. Chem.*, **2011**, *51*, 817-829.
27. New Water-soluble Organic Capsules Are Effective in Controlling Excited State Processes of Guest Molecules
R. Kulasekharan and V. Ramamurthy, *Org. Letters*, **2011**, *13*, 5092-5095.
28. Role of free space and weak interactions on geometric isomerization of stilbenes in a confined space
A. Parthasarathy and V. Ramamurthy, *Photochemical & Photobiological Sciences*, **2011**, *10*, 1455-1462.

29. Interaction Between Encapsulated Excited Organic Molecules and Free Nitroxides: Communication Across a Molecular Wall
M. Porel, S. Jockusch, M. F. Ottaviani, N. J. Turro and V. Ramamurthy, *Langmuir*, **2011** *27*, 10548-10555.
30. CIDEP from a Ketone Triplet State Incarcerated within a Nanocapsule to a Nitroxide in the Bulk Aqueous Solution
S. Jockusch, M. Porel, V. Ramamurthy, N. J. Turro, *J. Phys. Chem. Lett.* **2011**, *2*, 2877–2880.
31. Photochemical Generation and Reactivity of Carbenes Within an Organic Cavitand and Capsule: Photochemistry of Adamantanediazirines,
S. Gupta, R. Choudhury, D. Krois, G. Wagner, U. H. Brinker and V. Ramamurthy, *Org. Letters*, **2011**, *13*, 6074-6077.
32. Capsular complexes of non-polar guests with octa amine host detected in the gas phase
J. P. Da Silva, R. Kulasekharan, C. Cordeiro, S. Jockusch, N. J. Turro and V. Ramamurthy, *Org. Letters*, **2012**, *14*, 560-563.
33. Photoinduced Electron Transfer Between a Donor and an Acceptor Separated by a Capsular Wall
M. Porel, S. Jockusch, A. Parthasarathy. V. Jayathirtha Rao, N. J. Turro and V. Ramamurthy, *Chem. Commun.*, **2012**, *48*, 2710 - 2712.
34. Excited State Chemistry of New Capsular Assemblies in Aqueous Solution and on Silica Surfaces,
E. Ramasamy, N. Jayaraj, M. Porel and V. Ramamurthy, *Langmuir*, **2012**, *28*, 10-16.
35. Photoinduced Electron Transfer Across a Molecular Wall: Coumarin Dyes as Donors and Methyl viologen and TiO₂ as Acceptors
M. Porel, A. Klimczak, M. Freitag, E. Galoppini and V. Ramamurthy, *Langmuir*, **2012**, *28*, 3355-3359.
36. Gold Nanoparticles Functionalized With Deep-cavity Cavitands: Synthesis, Characterization and Photophysical Studies
S. R. Samanta, R. Kulasekharan, R. Choudhury, P. Jagadesan, N. Jayaraj and V. Ramamurthy, *Langmuir*, **2012**, *28*, 11920-11928
37. Supramolecular Control During Triplet Sensitized Geometric Isomerization of Stilbenes Encapsulated in a Water Soluble Organic Capsule
S. R. Samanta, A. Parthasarathy and V. Ramamurthy, *Photochemical & Photobiological Sciences*, **2012**, *11*, 1652-1660 (special issue dedicated to J. P. Desvergne)
38. Ultrafast Photoinduced Electron Transfer Between an Incarcerated Donor and a Free Acceptor in Aqueous Solution

- M. Porel, C. H. Chuang, C. Burda and V. Ramamurthy, *J. Am. Chem. Soc.*, **2012**, *134*, 14718-14721.
39. Photodimerization of Hydrophobic Guests within a Water Soluble Nanocapsule
A. Parthasarathy, S. R. Samanta and V. Ramamurthy, *Res. Chem. Intermed.*, **2013**, *39*, 73-87 (special issue dedicated to K. Mizuno)
40. Hydrocarbons depending on the chain length and head group adopt different conformations within a water-soluble nanocapsule: ^1H NMR and molecular dynamics studies
R. Choudhury, A. Barman, R. Prabhakar and V. Ramamurthy, *J. Phys. Chem. B*, **2013**, *117*, 398-407.
41. Deep- Cavity Cavitand Octa Acid as a Hydrogen donor: Photofunctionalization with Nitrenes Generated from Azidoadamantanes
R. Choudhury, S. Gupta, J. P. Da Silva, U. Brinker and V. Ramamurthy, *J. Org. Chem.*, **2013**, *78*, 1824-1832.
42. Role of free space and conformational control on photoproduct selectivity of optically pure α -alkyldeoxybenzoins within a water-soluble organic capsule
R. Kulasekharan; M. Maddipatla; A. Parthasarathy and V. Ramamurthy, *J. Org. Chem.*, **2013**, *78*, 942-949.
43. Efficient Singlet-Singlet Energy Transfer in a Novel Host-Guest Assembly Composed of an Organic Cavitand, Aromatic Molecules and Clay Nano-sheet
Y. Ishida, R. Kulasekharan, T. Shimada, S. Takagi, and V. Ramamurthy, *Langmuir*, **2013**, *29*, 1748-1753.
44. Photochemical Reaction Containers as Energy and Electron Transfer Agents
P. Jagadesan, B. Mondal, A. Parthasarathy, V. Jayathirtha Rao and V. Ramamurthy, *Org. Letters*, **2013**, *15*, 1326-1329.
45. Release of guests from encapsulated masked hydrophobic precursors by a phototrigger
N. Jayaraj, P. Jagadesan, S. R. Samanta, J. P. Da Silva and V. Ramamurthy, *Org. Letters*, **2013**, *15*, 4374-4377.
46. Synthesis, Characterization, Guest Inclusion and Photophysical Studies of Gold Nanoparticles Stabilized with Carboxylic Acid Groups of Organic Cavitands
B. Mondal, N. Kamatham, S. R. Samanta, P. Jagadesan, J. He and V. Ramamurthy, *Langmuir*, **2013**, *29*, 12703 - 12709.
47. Supramolecular-Surface Photochemistry: Supramolecular Assembly Organized on a Clay Surface Facilitates Energy Transfer Between an Encapsulated Donor and a Free Acceptor

- Y. Ishida, R. Kulasekharan, T. Shimada, S. Takagi and V. Ramamurthy, *J. Phys. Chem., C*, **2014**, *118*, 10198-10203.
48. Excited State Chemistry of Flavone Derivatives in a Confined Medium: ESIPT emission in aqueous medium
F. S. Santos, E. Ramasamy, V. Ramamurthy and F. Rodembusch, *Photochem. Photobiol. Sci.*, **2014**, *13*, 301–309.
49. A latent reaction in a model GFP chromophore revealed upon confinement: Photohydroxylation of *ortho*-halo benzylidene-3-methylimidazolidinones *via* an electrocyclization process
S. R. Samanta, J. P. Da Silva, A. Baldridge, L. M. Tolbert and V. Ramamurthy, *Org. Letters*, **2014**, *16*, 3304-3307
50. Photophysical studies of an encapsulated neutral guest intercalated into the 2-dimensional space of α -Zr(IV) phosphate
E. Ramasamy, I. K. Deshpriya, R. Kulasekharan, C. V. Kumar and V. Ramamurthy, *Photochem. Photobiol. Sci.*, **2014**, *13*, 301 – 309.
51. Photoisomerization and Photooxygenation of 1,4-Diaryl-1,3-dienes in a Confined Space
S. R. Samanta, R. Choudhury and V. Ramamurthy, *J. Phys. Chem. A.*, **2014**, *118*, 10554-10562.
52. Supramolecular photochemistry: From molecular crystals to water-soluble capsules
V. Ramamurthy and S. Gupta, *Chem. Soc. Rev.*, **2015**, *44*, 119 -135
53. Photorelease of Incarcerated Guests in Aqueous Solution with Phenacyl Esters as the Trigger
P. Jagadesan, José P. Da Silva, R. S. Givens and V. Ramamurthy, *Organic Letters*, **2015**, *17*, 1276-1279.
54. Supramolecular Photochemistry Concepts Highlighted with Select Examples
V. Ramamurthy and B. Mondal *J. Photochem. Photobiol. C: Photochem. Rev.*, **2015**, *23*, 68-102.
55. Supramolecular Photochemistry in Solution and on Surfaces: Encapsulation and Dynamics of Guest Molecules, and Communication Between Encapsulated and Free Molecules
V. Ramamurthy, S. Jockusch and M. Porel, *Langmuir*, **2015**, *31*, 5554-5570 (Invited Feature article)
56. Photochemistry within a water-soluble organic capsule, V. Ramamurthy, *Acc. Chem. Res.* **2015**, *48*, 2904-2917.
57. Excited state behaviour of benzoxazole derivatives in a confined environment afforded by a water soluble octa acid capsule
F. Santos, E. Ramasamy, V. Ramamurthy and F. S. Rodembusch, *J. Photochemistry and Photobiology A: Chemistry*, **2016**, *317*, 175-185. (Invited Feature Article)

58. Water-soluble octaacid capulse as a reaction container: Templated photodimerization of indene in water
A.Parthasarathy and V. Ramamurthy, *J. Photochem and Photobio A: Chemistry*, **2016**, *317*, 132-139.
59. Confinement effect on the photophysics of ESIPT fluorophores
F. S. Santos, E. Ramasamy, V. Ramamurthy and F. S. Rodembusch, *J. Materials Chem. C*. **2016**, *4*, 2820-2827.
60. Energy and Electron Transfer in a Three-component System Aligned on a Clay Nanosheet
T. Fujimura, E. Ramasamy, Y. Ishida, T. Shimada, S. Takagi, V. Ramamurthy, *Phys. Chem. Chem. Phys.*, **2016**, *18*, 5404-5411.
61. Supramolecular-Surface Photochemistry: Cascade Energy Transfer Between Encapsulated Dyes Aligned on Clay Nano-sheet Surface
T. Tsukamoto, E. Ramasamy, T. Shimada, S. Takagi and V. Ramamurthy, *Langmuir* **2016**, *32*, 2920–2927.
62. Reversible Disassembly-Assembly of Octa acid-Guest Capsule in Water Triggered by a Photochromic Process
A. Mohan Raj, F. Raymo and V. Ramamurthy, *Org. Lett.*, **2016**, *18*, 1566-1569.
63. Room Temperature Phosphorescence from a Guest Molecule Confined in Restrictive Space of an Organic-Inorganic Supramolecular Assembly
Y. Ishida, T. Shimada, E. Ramasamy, V. Ramamurthy and S. Takagi, *Photochem. Photobiol. Sci.*, **2016**, *15*, 959-963.
64. Photorelease of Incarcerated Caged Acids from a Hydrophobic Coumaryl Esters into Aqueous Solution
N. Kamatham, D. C. Mendes, José P. Da Silva, R. S. Givens, and V. Ramamurthy, *Org. Letters*, **2016**, *18*, 5480-5483
65. Photoinduced electron transfer across an organic molecular wall: Octaacid encapsulated ESIPT dyes as electron donors
F. S. Santos, E. Ramasamy, V. Ramamurthy and F. S. Rodembusch, *Photochem. Photobiol. Sci.*, **2017**, *16*, 840-844.
66. Melding Caged Compounds with Supramolecular Containers: The Photogeneration and Miscreant Behavior of the Coumarylmethyl Carbocation
N. Kamatham, José P. Da Silva, R. S. Givens and V. Ramamurthy, *Org. Lett.* **2017**, *19*, 3588–3591
67. What is the Opto-Electronic Effect of the Capsule on the Guest Molecule in Aqueous Host/Guest

Complexes? A Combined Computational and Spectroscopic Perspective
S. Bhandari, Z. Zheng, C-H. Chuang, M. Porel, Z-Q. You, V. Ramamurthy, C. Burda, J. M. Herbert, and B. D. Dunietz, *J. Phys. Chem. C* **2017**, *121*, 15481–15488.

68. Ultrafast Electron Transfer from Upper Excited State of Encapsulated Azulene to Acceptors Across an Organic Molecular Wall
A. Mohan Raj, M. Porel, P. Mukherjee, X. Ma, R. Choudhury, E. Galoppini, P. Sen and V. Ramamurthy, *J. Phys. Chem. C*, **2017**, *121*, 20205–20216.
69. Container Chemistry: Manipulating excited state behavior of organic guests within cavitands that form capsules in water
P. Jagadesan, S. R. Samanta, R. Choudhury and V. Ramamurthy, *J. Phys. Org. Chem.* **2017**, *30*, e3728; DOI: 10.1002/poc.3728
70. Volume conserving geometric isomerization of encapsulated azobenzenes in ground- and excited states and as radical ion
A. Mohan Raj and V. Ramamurthy, *Org. Lett.* **2017**, *19*, 6116–6119
71. Photochemistry in a capsule: Ultrafast electron transfer across an organic nanocapsular wall
C-H. Chuang, M. Porel, R. Choudhury, C. Burda and V. Ramamurthy, *J. Phys. Chem. B*, **2018**, *122*, 328–337
72. Probing the pH Dependent Assembly-Disassembly of Water-Soluble Organic Capsules with Coumarins and Anthracene
A. Mohan Raj, S. G. Talluri, M. Dubus, S. Gupta, B. Mondal and V. Ramamurthy, *J. Photochem. Photobiol. A*, **2018**, *355*, 398–407.
73. Selective Photocycloaddition of Alkenes in Confined Spaces: A Comparison between Cucurbiturils, Cyclodextrins, and Calixarenes as Reaction Containers
M. Pattabiraman, J. Sivaguru and V. Ramamurthy, *Israel J. Chem.* **2018**, *58*, 264–275
74. Understanding the Complexation of Aliphatic and Aromatic acids Guests with Octa acid
R. Choudhury and V. Ramamurthy, **2018**, *J. Phys. Org. Chem.* **2017**, DOI: 10.1002/poc.3795
75. Competitive binding of organic dyes between cucurbiturils and octaacid
S. Gupta, Y. Zhao, R. Varadharajan and V. Ramamurthy, *ACS Omega*, **2018**, *3*, 5083–5091.
76. Characterization and singlet oxygen oxidation of 1-alkyl cyclohexenes encapsulated within a water-soluble organic capsule
S. Gupta and V. Ramamurthy, *ChemPhotoChem.*, **2018**, *2*, 655–666.
77. Supramolecular-Surface Photochemistry: Assembly and photochemistry of host-guest capsules on silica surface

- E. Ramasamy and V. Ramamurthy, *Org. Lett.*, **2018**, *20*, 4187-4190.
78. Ultrafast Dynamics of Encapsulated Molecules Reveals New Insight on the Photoisomerization Mechanism for Azobenzenes
C. J. Otolski, M. Anthony Raj, V. Ramamurthy, and C. G. Elles, *J. Phys. Chem. Lett.*, **2019**, *10*, 121-127.
79. Ultrafast Trans→Cis Photoisomerization Dynamics of Alkyl Substituted Stilbenes in a Supramolecular Capsule,
C. J. Otolski, M. Anthony Raj, V. Ramamurthy, and C. G. Elles, *J. Phys. Chem. A* **2019**, *123*, 5061–5071.
80. Space constrained stereoselective geometric isomerization of 1,2 diphenylcyclopropane and stilbenes in an aqueous medium
A. Mohan Raj, Gaurav Sharma, Rajeev Prabhakar and V. Ramamurthy, *Org. Lett.* **2019**, *21*, 5243–5247.
81. Ultrafast solvation dynamics reveal the octa acid capsule's interior dryness depends on the guest
A. Das, G. Sharma, N. Kamatham, R. Prabhakar, Pratik Sen and V. Ramamurthy, 2019, *J. Phys. Chem. A*, **2019**, *123*, 5928–5936.
82. Supramolecular Photochemistry of Encapsulated Caged *ortho*-Nitrobenzyl Triggers
N. Kamatham, A. Mohan Raj, Richard S. Givens, José P. Da Silva and V. Ramamurthy, *Photochem. Photobiol. Sci.* **2019**, (2019), 18(10), 2411-2420
83. Reversal of Regioselectivity During Photodimerization of 2-Anthracene carboxylic acid in a water-soluble organic cavitand
X. Wei, A. Mohan Raj, J. Ji, W. Wu, G. Veerakanellore, C. Yang and V. Ramamurthy, *Org. Lett.* **2019**, *21*, 7868-7872
84. Xenon Triggers Phosphorescence at Room Temperature from Encapsulated Pyrene
A. Mohan Raj, Gaurav Sharma, Rajeev Prabhakar, and V. Ramamurthy, *J. Phys. Chem. A*, **2019**, *123*, 9123-9131