

## AJIT SADANA

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### EDUCATION

Ph. D., Chemical Engineering, University of Delaware, 1975.  
M. Chem. E., Chemical Engineering, University of Delaware, 1972.  
B. Tech., Chemical Engineering, Indian Institute of Technology, Kanpur, 1969.

### RESEARCH INTERESTS

Antigen-Antibody and Analyte-Receptor Binding Kinetics for Biosensors and Cell-Surface Interactions  
Fractal Analysis of ECGs and EEGs  
Applied Mathematics and Modeling of Biological Systems  
Interfacial Biological Reactions  
Protein Folding and Misfolding- Biomedical Implications and Onset of Diseases  
Modeling of Pollutant Streams

### ACADEMIC EXPERIENCE

Professor, University of Mississippi, July 1990-present  
Associate Professor, University of Mississippi, September 1981-June 1990.  
Adjunct Associate Professor, University of Rhode Island, 1984-1987.  
Visiting Associate Professor, Auburn University, 1980-1981.

### NON-ACADEMIC EXPERIENCE

Research Fellow, Cardiology Division, National Heart, Lung, and Blood Institute, NIH, Bethesda, Maryland, May-August 1999, July-August 2000.  
Research Fellow, ORISE, Oak Ridge National Laboratory, Oak Ridge, TN, Summer 1994, 1995, 1996, 1997, 1998, and 2000.  
Distinguished Fellow, NAVY/ASEE, Naval Research Laboratory, Washington, DC, Summer 1991.  
Senior Fellow, NAVY/ASEE, Naval Research Laboratory, Washington, DC, Summer 1990.  
Visiting Research Scientist, E.I. DuPont de Nemours & Co., Experimental Station, Wilmington, DE, Summer 1988.  
Senior Scientific Officer, Chemical Engineering, National Chemical Laboratory, Poona, India, 1975-1980.  
Project Engineer, Enviroengineering, Inc., Somerville, NJ, 1974-1975.

### BOOKS

Sadana, A., "Biocatalysis: Fundamentals of Enzyme Deactivation Kinetics," Prentice Hall, New Jersey, 1991.

Sadana, A., "Bioseparations of Proteins: Unfolding/Folding And Validations," Academic Press, San Diego, California, November 1997.  
Sadana, A., "Engineering Biosensors: Kinetics and Design Applications," Academic Press, San Diego, California, 2002.  
Sadana, A., "Biosensors: Kinetics of Binding and Dissociation Using Fractals," Elsevier, Amsterdam, 2003.  
Sadana, A., "Fractal Binding and Dissociation Kinetics for Different Biosensor Applications," Elsevier, Amsterdam, 2005.  
Sadana, A., "Binding and Dissociation Kinetics for Different Biosensor Applications Using Fractals," Elsevier, Amsterdam, 2006.  
Sadana, A. and Sadana, N., "Fractal Analysis of Binding and Dissociation Kinetics for Different Analytes on Biosensor Surfaces," Elsevier, Amsterdam, 2007.  
Sadana, A. and Sadana, N., "Handbook of Biosensors and Biosensor Kinetics," Elsevier, Amsterdam (November 2010).

## **EDITORIAL BOARD MEMBER**

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Who's Who in Finance and Industry  
Five Hundred Leaders of Influence  
Research Fellow, American Biographical Institute  
Five Thousand Personalities of the World

## **CONSULTANT**

First Chemical Corporation, Pascagoula, Mississippi  
National Institutes of Health (NIH), Bethesda, Maryland  
NBID Associates, Granville, Ohio  
National Science Foundation, Arlington, Virginia

## **UNIVERSITY COMMITTEES**

Academic Discipline (Chair), 2002-2007  
Sabbatical Review, 2008  
Interdisciplinary Academics and Research Task Force, 2008

## PUBLICATIONS

1. Shelton, KC, Taneja, R., and Sadana, A., "Fractal Binding and Dissociation Kinetics of Prion Proteins on Biosensor Surfaces," Emergent Applications of Fractals and Wavelets in Biology and Medicine, Editor, Rodrigo C Guido, Journal of Applied Mathematics And Computation, 207(1), 5-22 (2009).
2. Eni-Olorunda, I and Sadana, A., "Kinetics of Chemo/Biosensors," *Recognition Receptors in Biosensors*, Editor, Mohammed Zourob, Springer, New York, 2010, pp 819-844.
3. Zhu T., Jia, Y., Sadana, A., and Wang, S.S.Y., "Numerical Modeling of Ozonation of Organic Chemicals in Surface Water," World Environmental and Water Resources Congress 2009 Proceedings (CD-ROM), Kansas City, Missouri, 2009.
4. Sadana, A., "Fractal Binding and Dissociation Kinetics of Prion Proteins on Biosensor Surfaces," PA03/65, page S67, European Journal of Immunology, Supplement 1/09, Abstracts 2<sup>nd</sup> European Congress on Immunology, Berlin, Germany, September 13-16, 2009.
5. Taneja, R., Shelton, K.C., and Sadana, A., "Advances in Biosensing Methods, Sensors & Transducers Journal, 76(2), 945-968 (2007).
6. Taneja, R., Shelton, K.C., and Sadana, A., "Fractal Binding and Dissociation Kinetics and Interactions of Cancer Markers on Biosensor Surfaces, Journal of Receptors and Signal Transduction, 27, 1-21 (2007)
7. Morris, B.A., and Sadana, A., "A Fractal Analysis of the Binding Kinetics of the Heat-Shock Protein Chaperone DnaK on a SPR Biosensor Surface. Sensor Letters, 5 (1), 1-8 (2007).
8. Doke, A.M. and Sadana, A., "A Fractal Analysis of Heart-Related Compounds on Biosensor Surfaces, Journal of Receptors and Signal Transduction, 26, 337-357 (2006).
9. Doke, A. M, and Sadana, A., "Detection of Glucose and Related Analytes by Biosensors: A Fractal Analysis," Journal of Receptors and Signal Transduction, 26, 337-357 (2006).
10. Doke, A.M. and Sadana, A., "Detection of Glucose and Related Analytes by Biosensors," Biotechnology Progress, 22, 14-23 (2006).

11. Mathur, S.K., Doke, A.M., and Sadana, A., Identification of Hair Cycle Associated Genes from Time Course Gene Expression From Gene Expression Profile Using Fractal Analysis, International Journal of Bioinformatics Research and its Applications, 2(3), 249-258 (2006).
12. Sadana, A., "Protein Folding: Biomedical Implications," Encyclopedia of Surface and Colloid Science, Ed., P. Somasundaran, Taylor and Francis, New York, NY (2006).
13. Sadana, A., Doke, A.M. and Vo-Dinh, T., "Biosensor Surface Phenomena," Encyclopedia of Surface Phenomena, Ed. S.K. Lee, Marcel Dekker, New York, NY, (2006).
14. Sadana, A., Doke, A.M., and Vo-Dinh, T., "A Fractal Analysis of Glucose and related Analytes on Biosensor Surfaces at the Nanoscale Level, Nanotechnology in Biology and Medicine, Ed. Vo-Dinh, T., Chapter 28, pp. 507-522 (2006).
15. Sadana, A. and Doke, A.M., "Fractal Binding and Dissociation Kinetics of Lecithin Cholesterol Acyl Transferase (LCAT), a Heart-Related Compound, on Biosensor Surfaces, Chemical and Biological Sensing VII, Proceedings of SPIE, Volume 6218, Eds. P.J. Gardner and A.W. Fountain III, 6218-39 (2006).
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17. Jeyashekar, N.S., Sadana, A., and Vo-Dinh, T., "Protein Amyloidose Misfolding: Mechanisms, Detection, and Pathological Implications," In *Protein Nanotechnology: Protocols, Instrumentation, and Applications*, Ed., Vo-Dinh, T., Chapter 19, 417-435 (2005).
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19. Morris, B.A. and Sadana, A., "A Fractal Analysis of Pathogen Detection by Biosensors," *Biophysical Chemistry*, 113, 67-81 (2005).
20. Ramakrishnan, A., Tan, Y., and Sadana, A., "A Kinetic Study of Analyte-Receptor Binding and Dissociation for Surface Plasmon Resonance Biosensor Applications," *IEEE Sensors Journal*, 5(3), 356-364 (2005).
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22. Butala, H.D., Tan, Y., and Sadana, A., "Analyte-Receptor Binding on SPR Biosensors: A Fractal Analysis of Cre-loxP Interactions and their Influence of Cl, O, and S on Drug-Liposome Interactions, *Analytical Biochemistry*, 332, 10-22 (2004).
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  26. Sadana, A., "A Fractal Analysis Of Protein to DNA Binding Kinetics Using Biosensors," *Biosensors & Bioelectronics* , 18(8), 985-997 (2003).
  27. Ramakrishnan, A., and Sadana, A., "A Kinetic Study of Analyte-Receptor Binding And Dissociation Kinetics For Biosensor Applications: A Fractal Analysis For Two Different DNA Systems," *Biosystems*, 70, 255-270 (2003).
  28. Butala, H.D and Sadana, A., " A Fractal Analysis of Analyte-Estrogen Receptor Binding and Dissociation Kinetics Using Biosensors: Environmental Effects," *Journal of Colloid and Interface Science*, 263, 420-431 (2003).
  29. Butala, H.D., Ramakrishnan, A., and Sadana, A., "A Fractal Analysis Of Analyte-Receptor Binding And Dissociation Kinetics On Microcantilever Biosensors," *American Institute of Chemical Engineers Sensors Technology Conference Proceedings*, eds., C.C. Liu, H.B. Martin, and J.C. Angus, New York, NY, pp. 31-39, November 3-8, 2002.
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39. Sadana, A., "A Kinetic Study Of Analyte-Receptor Binding And Dissociation, And Dissociation Alone, For Biosensor Applications: A Fractal Analysis," Anal. Biochem., 291(1), 34 (2001).
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101. Chitnis, A. and Sadana, A., "pH-Dependent Enzyme Deactivation Models," Biotech. Bioengg., 34, 804 (1989).
102. Malhotra, A. and Sadana, A., "Influence Of Diffusion On First-Order Deactivation Of Microheterogeneous Enzyme Samples," Biotech. Bioengg., 34(5) 725 (1989).
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## PAPERS PRESENTED

1. Sadana, A., "Fractal Binding and Dissociation Kinetics of Prion Proteins on Biosensor Surfaces," 2<sup>nd</sup> European Congress on Immunology, Berlin, Germany, September 13-16, 2009.
2. Sadana, A. and Eni-Olorunda, I., "Binding and Dissociation Kinetics of Different Analytes on Novel Biosensor Systems: A Fractal Analysis," 2009 Annual AIChE Meeting, Nashville, Tennessee, November 7-13, 2009.
3. Sadana, A. and Eni-Olorunda, I., "Detection of Gases on Biosensor Surfaces," 2009 Annual AIChE Meeting, Nashville, Tennessee, November 7-13, 2009.
4. Sadana, A. and Eni-Olorunda, I., "Binding of Different Analytes on Biosensor Surfaces," 2009 Annual AIChE Meeting, Nashville, Tennessee, November 7-13, 2009).
5. Sadana, A. and Eni-Olorunda, I., "Fabrication, Commercialization, and Economics of Biosensors," 2009 Annual AIChE Meeting, Nashville, Tennessee, November 7-13, 2009).
6. Sadana, A., "Detection of Glucose and Related Analytes by Biosensors: A Fractal Analysis, BIT's 1<sup>st</sup> Annual World Congress of iBIO 2008, Hangzhou, China, May 17-21, 2008.
7. Sadana, A., "Fractal Binding and Dissociation Kinetics of Heart-Related Compounds on Biosensor Surfaces," BIT's 1<sup>st</sup> Annual World Congress of iBIO 2008, Hangzhou, China, May 17-21, 2008.
8. Davis P. Archer and Sadana A, "Physiological Cellular Reaction Detection on Biosensor Surfaces, Paper 188p, 2008 Annual AIChE Meeting, Philadelphia, PA, November 16-21, 2008.
9. Davis P. Archer and Sadana A, "Pollutants Detection on Biosensor Surfaces," Paper 630e, 2008 Annual AIChE Meeting, Philadelphia, PA, November 16-21, 2008.
10. Davis P. Archer and Sadana A, "Biosensors Involved in Drug Discovery," Paper 655a, 2008 Annual AIChE Meeting, Philadelphia, PA, November 16-21, 2008.
11. Davis P. Archer and Sadana A, "Detection of Analytes on Arrays/Microarrays/DNA Chips," Paper 681d, 2008 Annual AIChE Meeting, Philadelphia, PA, November 16-21, 2008.

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13. Sadana, A., Taneja, R., and Shelton, KC, "Fractal Analysis of Binding Interactions of Environmental Contaminants on Biosensor Surfaces," Paper 389d, 2007 Annual AIChE Meeting, Salt Lake City, Utah, November 4-9, 2007.
14. Sadana, A., Taneja, R., and Shelton, KC, "Fractal Binding and Dissociation Kinetics of Prion Proteins on Biosensor Surfaces," Paper 576h, Annual AIChE Meeting, Salt Lake City, Utah, November 4-9, 2007.
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17. Sadana, A., Taneja, R., and Shelton, KC, "A Fractal Analysis of the Binding Kinetics of the Heat Shock Protein Chaperone DnaK on a SPR Biosensor Surface," Paper 458d, Annual AIChE Meeting, Salt Lake City, Utah, November 4-9, 2007.
18. Sadana, A., "Fractal Analysis of Cancer Markers on Biosensor Surfaces," Paper 523d, Annual AIChE Meeting, Salt Lake City, Utah, November 4-9, 2007.
19. Sadana, A., and Doke, A.M., "Fractal Analysis of Interleukin Binding and Dissociation Kinetics on Biosensor Surfaces," 2006 Annual American Institute of Chemical Engineers Meeting, San Francisco, November 12-17, 2006.
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And Security Symposium, An SPIE Event, Orlando, Florida, April 17-21, 2006.

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27. Sadana, A., "A Fractal Analysis of Binding and Dissociation Kinetics of Glucose and Other Analytes On Biosensor Surfaces," Tenth Annual Institute of Biological Engineering Meeting, The University of Georgia, Athens, Georgia, March 4-6, 2005.
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32. Sadana, A., "Binding and Dissociation Kinetics Using Fractals to Analyze Electrostatic Effects and Randomly Coupled and Oriented Coupled Receptors on Biosensor Surfaces: Implications in Autoimmune Diseases," 12<sup>th</sup> International Conference on Immunology and 4<sup>th</sup> Annual Conference of the Federation Of Clinical Immunology Sciences, Montreal, Canada, July 18-23, 2004.
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- DnaK on a SPR Biosensor Surface,” 2004 Annual American Institute of Chemical Engineers Meeting, Austin, Texas, November 7-12, 2004.
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97. Sadana, A., "Protein Adsorption And Inactivation At Interfaces. Influence Of Heterogeneities," Annual AIChE Meeting, Miami Beach, November 1-6, 1992.
98. Sadana, A., "Inactivation Of Proteins And Other Biological Macromolecules During Chromatographic Methods Of Bioseparation" Annual AIChE Meeting, Miami Beach, November 1-6, 1992.
99. Sadana, A. and Sii, D., "Binding Kinetics Of Antigen By Immobilized Antibody: Influence Of Reaction Order And External Diffusional Limitations," Annual AIChE Meeting, Los Angeles, CA, November 17-22, 1991.
100. Sadana, A., "The Binding Kinetics Of Antigen By Immobilized Antibody Or Of Antibody By Immobilized Antigen. Influence Of Lateral Interactions," Annual AIChE Meeting, Los Angeles, CA, November 17-22, 1991.
101. Sadana, A. and Sii, D., "The Binding Kinetics Of Antigen By Immobilized Antibody: Influence Of A Variable Rate Coefficient On External Diffusion Limited Kinetics," Annual AIChE Meeting, Los Angeles, CA, November 17-22, 1991.
102. Sadana, A. and Sii, D., "Influence Of Diffusional Limitations On The Binding Kinetics Of Antibody In Solution By Immobilized Antigen" Annual AIChE Meeting, Los Angeles, CA, November 17-22, 1991.
103. Sadana, A. and Raju, R.R., "Bioseparation And Purification Of Proteins: An Analysis Of Novel Techniques And Inactivating Influences," Annual AIChE Meeting, Chicago, IL, November 11-16, 1990.
104. Sadana, A. and Raju, R.R., "Protein/Enzyme Inactivation During Different Chromatographic Methods Of Separation," Annual AIChE Meeting, Chicago, IL, November 11-16, 1990.
105. Malhotra, A. and Sadana, A., "Role Of The Initial State Distribution On First-Order Deactivation Of Microheterogeneous Enzyme Samples," Annual AIChE Meeting, Chicago, IL, November 11-16, 1990.
106. Sadana, A., "Protease Inactivation During Downstream Separation," Annual AIChE Meeting, Washington, DC, November 27-December 2, 1988.
107. Sadana, A., "Inactivation Of Proteins and Enzymes During Bioseparation," Annual AIChE Meeting, Washington, DC, November 27-December 2, 1988.
108. Malhotra, A. and Sadana, A., "Influence Of Microheterogeneity On Enzyme Deactivation," Annual AIChE Meeting, Washington, DC, November 27-December 2, 1988.
109. Sadana, A., "Proteins/Enzymes Inactivation At Air-Liquid And Gas-Liquid Interfaces," Annual AIChE Meeting, Washington, DC, November 27-December 2, 1988.
110. Sadana, A., "Protease Inactivation During Downstream Processing," CANBIOCON 88, Montreal, April, 1988.
111. Sadana, A. and Malhotra, A., "Effect Of Enzyme Microheterogeneity And Distribution Of Initial Enzyme States On First-Order Deactivation And Conversion In Enzyme Reactors," 9th Symposium On Biotechnology For Fuels And Chemicals, Boulder, CO, May 5-8, 1987.

112. Sadana, A. and Henley, J.P., "Effect Of Enzyme Microheterogeneity On First-Order Deactivation And On Conversion In Enzyme Reactors," Ninth International Conference On Enzyme Engineering, Santa Barbara, CA, October 4-9, 1987.
113. Sadana, A., "Effect Of Severe Intra-Particle Diffusional Limitations On Optimum Temperature Operations Policies In Deactivating Fixed-Bed Reactors," Annual AIChE Meeting, New York, NY, November 15-20, 1987.
114. Sadana, A. and Henley, J.P., "Deactivation-Disguised Kinetics," 39th Conference On Engg. In Medicine And Biology, Baltimore, MD, September 13-16, 1986.
115. Sadana, A. and Henley, J.P., "Influence Of Chemical Modification On Enzyme Inactivation Kinetics And Stability," 8th Symposium On Biotechnology For Fuels And Chemicals, Gatlinburg, TN, May 16-18, 1986.
116. Sadana, A. and Henley, J.P., "Deactivation Theory," National AIChE Meeting, Boston, MA, August 24-27, 1986.
117. Sadana, A. and Henley, J.P., "A Mathematical Analysis Of Aging-Influenced Enzyme Deactivation Kinetics," 7th Annual EMBS Conference, Chicago, IL, September 27-30, 1985.
118. Sadana, A. and Henley, J.P., "Analysis Of Enzyme Deactivations By A Series-Type Mechanism," 8th International Enzyme Engineering Conference, Helsingor, Denmark, September 22-27, 1985.
119. Sadana, A. and Henley, J.P., "Influence Of Enzyme Modification On The Activity And Stability Of Enzymes. An Analysis By A Series-Type Mechanism," Biotech 85, Geneva, Switzerland, May 21-23, 1985.
120. Sadana, A. and Henley, J.P., "Analysis Of The Effect Of Chemical Modification On The Activity And Stability Of Enzymes," 7th Symposium On Biotechnology For Fuels And Chemicals, Gatlinburg, TN, May 15-18, 1985.
121. Henley, J.P., Snipes, C.R., and Sadana, A., "Stabilization Of Enzyme Activity By A Series-Type Mechanism. Biomedical Applications," Annual Conference On Engineering In Medicine And Biology, Los Angeles, CA, September 17-19, 1984.
122. Henley, J.P. and Sadana, A., "An Analysis Of Enzyme Stabilization By A Series-Type Mechanism. Influence Of Chemical Modifiers," 6th Symposium On Biotechnology For Fuels And Chemicals, Gatlinburg, TN, May 15-18, 1984.
123. Henley, J.P. and Sadana, A., "Influence Of External Mass Transfer Limitations On Optimum Temperature Operations Policies In Deactivating Fixed-Bed Reactors," National AIChE Meeting, Atlanta, GA, March 11-14, 1984.
124. Henley, J.P. and Sadana, A., "A Categorization Of Enzyme Deactivations Using A Series-Type Mechanism," VII International Biotechnology Symposium, New Delhi, India, February 19-24, 1984.
125. Henley, J.P. and Sadana, A., "Influence Of Intermediate Activity On Series-Type Enzyme Deactivations. Biomedical Applications," Second Southern Biomedical Engineering Conference, San Antonio, TX, September 26-27, 1983.
126. Henley, J.P. and Sadana, A., "Series-Type Enzyme Deactivation Kinetics. Influence Of Immobilization, Chemical Modifiers, And Aging," VII International Conference On Enzyme Engineering, White Haven, PA, September 25-30, 1983.

127. Henley, J.P. and Sadana, A., "Modeling Of Series-Type Enzyme Deactivations. Influence Of Precursor (Intermediate) Activity On Inactivation Kinetics," AIChE Summer National Meeting, Denver, CO, August 28-31, 1983.
128. Henley, J.P. and Sadana, A., "Modeling Of Series-Type Enzyme Deactivations. A Simple Probabilistic Approach," AIChE Summer National Meeting, Denver, CO, August 28-31, 1983.
129. Henley, J.P. and Sadana, A., "Influence Of Intermediate Activity On Series-Type Enzyme Deactivation Kinetics," Symposium On Biotechnology For Fuels And Chemicals, Gatlinburg, TN, May 1983.
130. Sadana, A., "On The Influence Of Optimum Temperature Operations Policies On The Intrinsic Order Of Deactivation And Reaction In Fixed-Bed And Batch Reactors," IASTED International Symposium On Applied Simulation And Modeling, ASM 83, San Francisco, CA, May 16-18, 1983.
131. Sadana, A., "Improved Optimum Temperature Operations In Deactivating Fixed-Bed Reactors," 1983 AIChE Spring National Meeting, Houston, TX, March 27-31, 1983.
132. Sadana, A., "Simple Probabilistic Approach To Enzyme Deactivations. Effect Of Enzyme Defects And Aging On Kinetics," Annual AIChE Meeting, Los Angeles, CA, November 14-18, 1982.
133. Sadana, A., "Effect Of Enzyme Defects And Aging On Enzyme Deactivation Kinetics. A Simple Probabilistic Approach," AIChE National Meeting, Anaheim, CA, June 7-10, 1982.
134. Sadana, A., "On A Simple Probabilistic Approach To Disguised Kinetics In Enzyme Deactivation," Fourth Symposium On Biotechnology In Energy Production And Conservation, Gatlinburg, TN, May 11-14, 1982.
135. Sadana, A., "Probability Theory Applied to Enzyme Deactivations," AIChE National Meeting, Orlando, FL, February 28-March 3, 1982.
136. Sadana, A., "Intra-Particle Diffusion Effects In Liquid-Phase Hydrocarbon Oxidations," AIChE National Meeting, Orlando, FL, February 28-March 3, 1982.
137. Sadana, A., "An Optimum Temperature Policy In Deactivating Fixed-Bed Reactors," 32nd Annual IChE Meeting, Indian Institute Of Technology, Bombay, India, December 21-24, 1979.
138. Sadana, A., "On Critical Catalyst Concentration In Liquid-Phase Hydrocarbon Oxidations," 32nd Annual IChE Meeting, Indian Institute Of Technology, Bombay, India, December 21-24, 1979.
139. Sadana, A., "On An Optimum Temperature Operation Criterion For Deactivating Immobilized Enzyme Fixed-Bed And Batch Reactors," 31st Annual IChE Meeting, Cochin, India, December 23-26, 1978.
140. Sadana, A., "Intra-Particle Diffusion Effects In Aqueous-Phase Phenol Oxidation," The 4th National Symposium On Catalysis, Indian Institute Of Technology, Bombay, India, December 2-4, 1978.
141. Sadana, A., "An Optimum Temperature Operations Policy For A Deactivating Moving-Bed Reactor," 4th National Symposium On Catalysis, Indian Institute Of Technology, Bombay, India, December 2-4, 1978.



142. Sadana, A., "Multi-Effect Evaporation And Pyrolyzation Of Waste-Water Residues And Energy Recovery," Conference On "Zero Discharge Of Wastewater Residues," Sponsored By EPA, Mayflower Hotel, Washington, DC, February 1975.
143. Sadana, A. and Katzer, J.R., "Catalytic Oxidation Of Phenol In Aqueous Solution," Fourth Environmental Engineering And Science Conference, Speed Scientific School, University of Louisville, KY, March 4-5, 1974.
144. Ficke, H.H., Katzer, J.R., and Sadana, A., "An Economic Analysis Of Heterogeneously-Catalyzed Aqueous-Phase Oxidation Of Phenol," Annual Industrial Wastes Conference, Purdue University, Lafayette, IN, May 7-9, 1974.
145. Sadana, A. and Katzer, J.R., "Catalytic Oxidation Of Phenol In Aqueous Solution," Catalysis Club Of Philadelphia, PA, March 2-4, 1974.

## **INVITED LECTURES**

1. "Economics of Biosensors, Keynote Lecture, International Conference on Advances in Mechanical and Building Sciences in the 3<sup>rd</sup> Millennium, Vellore Institute of Technology, Vellore, India, December 14-16, 2009.
2. Protein Folding/Misfolding: Biomedical Implications," Biological Engineering Department, University of Missouri, Columbia, November 19, 2002.
3. "An Analysis Of Cell-Ligand, Ligand-Receptor, And Antigen-Antibody Interactions Occurring In Parallel Using Biosensors," 76<sup>th</sup> Colloid And Surface Science Symposium, University Of Michigan, Ann Arbor, Michigan, June 23-26, 2002.
4. "A Fractal Analysis Of Analyte-Estrogen Receptor Binding Kinetics On Biosensors: Environmental And Biomedical Applications," 76<sup>th</sup> Colloid And Surface Science Symposium, University Of Michigan, Ann Arbor, Michigan, June 23-26, 2002.
5. "A Kinetic Study Of Analyte-Receptor Binding And Dissociation For Surface Plasmon Resonance Biosensor Applications," IEEE Sensors 2002, Orlando, Florida, June 12-14, 2002.
6. "A Fractal Analysis Of Electrocardiograms: Stratification of Hereditary Risk For Hypertrophic Cardiomyopathy," Civil Engineering Department, September 6, 2001.
7. "A Fractal Analysis of Cellular Analyte-Receptor Binding Kinetics Using Biosensors," Chemical Engineering Department, University of Missouri, February 12, 2001.
8. "A Fractal Analysis Of Electrocardiograms To Risk-Stratify Family Members For Hypertrophic Cardiomyopathy," Department of Biological Engineering, University Of Missouri, February 13, 2001.
9. "A Fractal Analysis Of Electrocardiograms," Electrical Engineering Department, University of Mississippi, September 1999.

10. "Influence Of Diffusion To Fractal Surfaces On The Binding Kinetics For Antibody-Antigen, Analyte-Receptor, And Analyte-Receptorless (Protein) Systems," Mid-Atlantic Regional Meeting, American Chemical Society, Theme: Drug Discovery, Pace University, Pleasantville, NY, May 27-30, 1997.
11. "A Fractal Analysis Of The Influence Of Non-Specific Binding On Antigen-Antibody Binding Kinetics For Biosensor Applications," Mid-Atlantic Regional Meeting, American Chemical Society, Theme: Drug Discovery, Pace University, Pleasantville, NY, May 27-30, 1997.
12. "Antigen-Antibody Binding Kinetics For Biosensor Applications: A Fractal And Engineering Analysis," National Center for Physical Acoustics, University of Mississippi, March 4, 1997.
13. "Protein Adsorption on Biomaterials," Chemistry Department, University of Mississippi, March 29, 1994.
14. "Effect Of Chemical Modification On Enzyme Activities And Stabilities," Symposium On Biocatalyst Design For Stability And Specificity, 202 ACS Meeting, New York, September 1991.
15. "Basics Of Enzyme Deactivation," Memphis State University, Memphis, TN, March 1991.
16. "Influence Of Chemical Modification On Enzyme Activity And Stability. A Categorization," Experimental Station, E.I. duPont and Company, Wilmington, DE, August 1988.
17. "Effect Of Chemical Modification On Enzyme Activities And Stabilities," Vanderbilt University, Nashville, TN, November 1988.
18. "Effect Of Chemical Modification On Enzyme Activities And Stabilities," Eidgenossiche Technische Hochschule, Zurich, Switzerland, May 1985.
19. "Series-Type Enzyme Deactivations. Influence Of Intermediate Activity On Deactivation Kinetics And Of Chemical Modifiers On Enzyme Stabilization," Eidgenossiche Technische Hochschule, Zurich, Switzerland, May 1984.