

15:30

EP 6 Electron Transfer at Large Distances - The Two Reaction Coordinates Case.* José Nelson ONUCHIC. Caltech, Pasadena, CA 91125. — Electron Transfer is a very important reaction in many biological events such as photosynthesis and oxidative phosphorylation. In many of these reactions, most of the interesting dynamics can be included by using two reaction coordinates: one fast (local high frequency vibration modes) and one slow (outer-sphere modes such as solvent polarization). We report a model to describe this problem, which uses path integral techniques to calculate electron transfer rates and also the Fokker Planck equations associated with it. Different limiting cases lead to different results such as exponential or non-exponential time decay for the transfer probability. Conditions for the validity of the adiabatic or the non-adiabatic limits will be discussed. Application of this model for real systems is presented, in particular for a porphyrin rigidly linked to a quinone, which is a very interesting model compound for primary events of photosynthesis. This model can also be used for other biological reactions such as CO or O₂ binding to heme proteins.

* supported by the Brazilian Agency CNPq, by the Universidade de São Paulo, and by the NSF (Grant PCM-8406049).

15:42

EP 7 Kinetics of the Growth of Domains of Sickie Hemoglobin Polymers. S. BASAK, F. A. FERRONE, A. J. MARTINO & H. X. ZHOU, Drexel U.—We have employed laser photolysis

16:06

EP 9 Resonance Raman Studies of the Binding of NADH AND NAD⁺ to Alcohol Dehydrogenases by ROBERT CALLENDER, KWOK TO YUE, DEHUAI CHEN, and DONALD SLOAN, Physics (D.C. and R.C.) and Chemistry (D.S.) Departments, City College of N.Y., N.Y. 10031 and Physics Department (K.T.Y.) Emory University, Atlanta, GA 30322.-- We have extended our Raman studies (Biochemistry 23, 6480, 1984) on the binding of reduced nicotinamide adenine dinucleotide (NADH) to liver alcohol dehydrogenase (LADH) to include the binding of the oxidized coenzyme (NAD⁺) to LADH and the binding of both reduced and oxidized coenzymes to yeast alcohol dehydrogenase (YADH). The Raman spectrum of NAD⁺ bound to LADH is identical to that of NADH bound to LADH, suggesting that the coenzymes have changed into a common conformation which will facilitate the next step in the enzymatic reaction. Furthermore, we found no pH dependence of the Raman spectra of either NADH or NAD⁺ between 6.5 and 9.6 when bound to LADH. We have also examined the effect of inhibitors to the Raman spectrum of the bound coenzymes. Very small changes were observed on the bound NADH spectrum by the presence of excess isobutyramide and dimethyl sulfoxide. However, significant changes occur when pyrazole binds to the binary complex LADH/NAD⁺, indicating the involvement of the coenzyme to the binding of pyrazole. In contrast to the results found for LADH, the spectra of NADH and NAD⁺ when bound to YADH are almost identical to their respective spectra in solution, suggesting that both coenzymes are only loosely bound to YADH.

16:18 *cancelled*
EP 10 Calmodulin and Cell Survival.* M.W. Williams, J.E. Turner, and A.W. Hsieh, Health and Safety Research Division, Oak Ridge National Laboratory--We report a

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In: Meeting of the American Physical Society

Vol. 32(3): 387, Las Vegas, Nevada, 31 mar - 1 apr 1980

Bull. Amer. Phys. Soc.

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Campo	Dado
*****	Documento 1 de 1
No. Registro	000833495
Tipo de material	TRABALHO DE EVENTO-RESUMO PERIODICO - NACIONAL
Entrada Principal	Onuchic, J N
Título	Electron transfer at large distances the two reaction coordinates core.
Imprensa	, 1986.
Descrição	p.387.
Autor Secundário	Meeting of the American Physical Society (1986 Las Vegas)
Fonte	Bulletin of the American Physical Society, v.31, n.3 , p.387, 1986
Unidade USP	IFQSC-F -- INST DE FÍSICA DE SÃO CARLOS
Localização	IFSC PROD001530