

Bulletin of the American Physical Society

88-55
Program of the 1985 Annual Meeting
of the Southeastern Section
in Athens, GA; 2-4 December 1985

Program of the 38th Annual Meeting
of the Division of Fluid Dynamics
in Tucson, AZ; 24-27 November 1985



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SESSION RE: BIOPHYSICAL AND BIOCHEMICAL APPLICATIONS OF LASERS

Thursday morning; 21 November 1985; Room 1.202 at 9:45 A.M.; K. S. Peters, presiding

10:30

RE 2 Femtosecond Spectroscopy of Bacteriorhodospin.

W. ZINTH, M. C. NUSS, H. J. POLLAND, and W. KAISER, *Technische Universitaet Muenchen, West Germany.*

In the primary steps of the photocycle of bacteriorhodopsin (BR), an electronic groundstate intermediate is formed, which stores the energy needed to drive the subsequent photochemical steps. Femtosecond spectroscopy of the formation of state K yields the following picture of the primary steps¹:

- (i) From the electronically excited state, a first ground state intermediate J is formed within 430 fs.
- (ii) The state K, stable on the picosecond timescale is formed with a time constant of 5 ps.
- (iii) The formation of J and K is not influenced by deuteration of the BR sample.

We conclude that proton movement is not relevant for the first steps of the photocycle and that rapid isomerisation takes place during the formation of the J intermediate. The similarities between the absorption spectra of states J and K suggest that the 5 ps kinetic of the J→K transition is due to the molecular rearrangement following the isomerisation of the retinal chromophore.

¹ M. C. Nuss, W. Zinth, W. Kaiser, E. Koelling and D. Oesterheilt, *Chem. Phys. Lett.* **117**, 1 (1985).