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Sommario/riassunto

This is a book about the physical processes in reacting complex molecules, particularly biomolecules. In the past decade scientists from different fields such as medicine, biology, chemistry and physics have collected a huge amount of data about the structure, dynamics and functioning of biomolecules. Great progress has been achieved in exploring the structure of complex molecules. However, there is still a lack of understanding of the dynamics and functioning of biological macromolecules. In particular this refers to enzymes, which are the basic molecular machines working in living systems. This book contributes to the exploration of the physical mechanisms of these processes, focusing on critical aspects such as the role of nonlinear excitations and of stochastic effects. An extensive range of original results has been obtained in the last few years by the authors, and these results are presented together with a comprehensive survey of the state of the art in the field.