Many enzymatic and catalytic systems involve cyclic reactions processes in which substances after performing successive transformations end up in their initial state. This situation is frequently found for example in enzymes reactions with substrates, in the transport of an ion across a membrane or in the mechanism for muscle contraction. Understanding the kinetics of these reaction cycles and the principles governing the free energy transduction in the processes is vital for the knowledge of the functionalities of chemical and living systems. The traditional way to analyze the kinetics of these cycles is based on the law of mass action (LMA). One assumes that the fraction of one type of molecules that change into others in a short time interval is proportional to that time interval, with the proportionality factor being a constant rate. This assumption leads to the formulation of kinetic equations for the evolution of the concentrations of the different species intervening in the cycle from which relevant information about the existence of stationary states and their nature or the validity of detailed balance principle can be obtained. The kinetic approach resulting from the application of the LMA has been related to the non-equilibrium thermodynamics (NET) approach only in the linear regime in which the reaction rates are proportional to the affinities. A three-state reaction cycle was precisely proposed by Onsager to illustrate the validity of the reciprocity laws and to show their equivalence with the detailed balance principle. A first step toward the use of the NET method for a description of the kinetic nonlinear domain was given in [1], for the case of a single unimolecular reaction. It was shown that if the chemical process is viewed not as a sudden jump from the initial to the final state, as done in NET, but as a continuum transformation modelled by a diffusion process of the probability of a reaction coordinate through different molecular configurations, the reaction rate thus obtained coincides with that of the LMA. To model the chemical transformation as a diffusion process is consistent with the existence of the time scale separation mentioned and is equivalent to interpret local equilibrium in the space of the reaction coordinate. This scheme, named mesoscopic non-equilibrium thermodynamics [2], since it considers the probability density as a state variable in the thermodynamic sense, has been applied to different kinetic processes such as adsorption, nucleation, thermal emission, evaporation and condensation phenomena or active transport. We will show how chemical cycles operating outside equilibrium can also be studied under the perspective of the second law [3].