ChemTech

International Journal of ChemTech Research
CODEN(USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.10 No.10, pp 625-631,2017

Effect of binding polynomials on feasibility study of biochemical reactions

Tamil ElakkiyaRajendran*, ThenmozhiMuthukumarasamy

Department of Chemical Engineering, Annamalai University, Annamalai Nagar- 608 002, Tamil Nadu, India.

Abstract: In a typical biochemical reaction at specified pH, each metabolite in a particular reaction may be available as an equilibrated mixture of different charged ions and it is termed as "metabolite species". At equilibrium, each metabolite is represented as pseudoisomer group of metabolite species. At a particular pH, pMg, ionic strength I, T and P, the sum of the metabolite species taking part in a biochemical reaction were considered for establishing the stoichiometry. The transformed Gibbs free energy change of reaction ($\Delta_r \boldsymbol{G'^0}$) was calculated and compared with standard Gibbs free energy change of reaction ($\Delta_r \boldsymbol{G^0}$). The results indicated that there is difference in values of $\Delta_r \boldsymbol{G'^0}$and $\Delta_r \boldsymbol{G^0}$. Hence, it is shown that the thermodynamic property *G* is not sufficient to provide a criterion for the spontaneity of biochemical reaction. *G'* must be minimized rather than *G* at equilibrium in case of biochemical reactions at constant pH and pMg.

Keywords : Transformed and standard Gibbs free energy change of reaction; glucose to G6P hydrolysis; pH and pMg; ionic strength.

*****