

## Four-dimensional brusselator model with periodical solution

### ABSTRACT

In the paper, a four-dimensional model of cyclic reactions of the type Prigogine's Brusselator is considered. It is shown that the corresponding dynamical system does not have a closed trajectory in the positive orthant that will make it inadequate with the main property of chemical reactions of Brusselator type. Therefore, a new modified Brusselator model is proposed in the form of a four-dimensional dynamic system. Also, the existence of a closed trajectory is proved by the DN-tracking method for a certain value of the parameter which expresses the rate of addition one of the reagents to the reaction from an external source.

**Keyword:** Chemical reaction; Closed trajectory; DN-tracking method; Discrete trajectory; Numerical trajectory