

The use of the Arrhenius equation demands very delicate treatment under usage in mathematical modeling schemes

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This article presents a critical analysis of the widely used practice of using the Arrhenius equation for the mathematical modelling of very many physical and chemical rate process. This approach may also be used to characterise the controls and mechanisms of the rate processes investigated. In our opinion, the use of the Arrhenius relationship often can only approximate to the behaviour of such systems, exemplified by the systems discussed below, including the work of N N Semenov, A G Merzhanov, A K Galwey, etc. We draw attention to 'erroneous' experimental design, including the so-called 'global kinetic mechanism' and other widespread uses of theoretical models which do not necessarily represent the real situation. Such limitations in rate data analyses impact negatively throughout this branch of science. Here we attempt to question accepted practices realistically and find answers to the types of studies under consideration that do not include the misconceptions often contained therein. We also discuss the specific form of Arrhenius-type equation as a relationship meriting detailed investigations.