Supplementary Material for Article

Problems with the determination of activation energy as function of the reacted fraction from thermoanalytical experiments

Gábor Várhegyi

Institute of Materials and Environmental Chemistry, ELKH Research Centre for Natural Sciences, PO Box 286, Budapest, Hungary 1519
Email: varhegyi.gabor@ttk.hu or gvarhegyi@gmail.com

Scope of this Supplementary Material

In the study simulated experiments were evaluated by assuming different $E(\alpha)$ functions. The figures of the article display the employed $E(\alpha)$ functions and illustrate the fit quality obtained with their usage. The detailed equations, their parameters, the evaluated data, and the data of the best fitting curves are presented in this Supplementary Material for readers who happen to be interested in these types of calculations.

There is a separate Excel file for each $E(\alpha)$. The first sheet in each Excel file contains the equations and their parameters. The further sheets in the Excel files contain the data for each heating rate.

> The content of the Excel files was generated by computer programs and were copied into the Excel files manually. Technically the software generated unformatted text files where the subscripts, superscripts, and the α character were represented by UTF-8 symbols. The text files were opened by a text editor and their contents were copied into the corresponding Excel sheets (by Select all, Copy and Paste operations).

Further information about the employed methods

References [14-18] of the article contain the description of the employed methods with examples of their application. These are Open Access works; their DOI links can easily bring them to the reader's computer. Each of these works is accompanied by a Supporting Information file or a Supplementary Material which contains explanations and details about the methods; shows further figures; and lists parameter values. Though these materials can also be found through the DOI links of the corresponding papers, they can be accessed more conveniently by the direct internet links listed below:

[14] Várhegyi G. Empirical models with constant and variable activation energy for biomass pyrolysis. Energy Fuels 2019;33:2348-58. https://doi.org/10.1021/acs.energyfuels.9b00040
Supporting Information

[15] Várhegyi G, Wang L, Skreiberg Ø. Non-isothermal kinetics: best-fitting empirical models instead of model-free methods. J Therm Anal Calorim. 2020;142:1043-1054 https://doi.org/10.1007/s10973-019-09162-z ***Supplementary Material***

[16] Várhegyi G, Wang L, Skreiberg Ø. Empirical kinetic models for the combustion of charcoals and biomasses in the kinetic regime. Energy Fuels 2020;34:16302-9. https://dx.doi.org/10.1021/acs.energyfuels.0c03248 ***Supporting Information***

[17] Várhegyi G, Wang L, Skreiberg Ø. Empirical kinetic models for the CO_2 gasification of biomass chars. Part 1. Gasification of wood chars and forest residue chars. ACS Omega 2021, 6, 27552-60. https://doi.org/10.1021/acsomega.1c04577 ***Supporting Information***

[18] Várhegyi G, Wang L, Skreiberg Ø. Kinetics of the CO2 gasification of woods, torrefied woods, and wood chars. Least squares evaluations by empirical models. J Therm Anal Calorim. 2023; https://doi.org/10.1007/s10973-023-12151-y ***Supplementary Material***