DESCRIPTION

Thermochimica Acta publishes original research contributions covering all aspects of thermoanalytical and calorimetric methods and their application to experimental chemistry, physics, biology and engineering. The journal aims to span the whole range from fundamental research to practical application.

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AUDIENCE

Principally Chemists but also Physicists, Biologists, Metallurgists and Mineralogists interested in the techniques and applications of thermal analysis and thermochemistry.

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INTRODUCTION

Thermochimica Acta publishes original research contributions covering all aspects of thermoanalytical and calorimetric methods and their application to experimental chemistry, physics, biology and engineering. Specific areas of research include:
- instrumentation and theory of instrumentation
- new and improved methods of investigation
- analysis and interpretation of research data
- fundamental research and industrial application.

Papers from new emerging areas of the field are particularly welcome. The journal publishes regular articles, communications (novel, unexpected experimental results or interpretation presented within four printed pages), and feature articles (usually invited by the Editors).

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Appendix A. Brief recommendations for reporting thermal analysis data
Because thermal analysis techniques involve the measurement of some system parameter as a function of temperature [1], it is essential that all experimental details be given in the typescript. The reports of the Nomenclature Committee of the International Confederation for Thermal Analysis (ICTA) [2,3] and the recommendations of McAdie [4,5] should, in general, be adhered to as far as typescript space permits. Some of the recommendations are briefly summarized here; for further information the original references should be consulted.

(1) Identify all materials by a definitive name, an empirical formula, or equivalent compositional data.

(2) State the sources of all materials, their chemical purities, and other pertinent data.

(3) Give the furnace heating rate over the temperature range of interest.

(4) Identify the sample chamber atmosphere by pressure, composition and purity. The conditions of atmosphere control (static, dynamic or self-generated) should be specified.

(5) Label the abscissa in temperature units or time.

In reporting TG data:

(6) Give the type of thermobalance employed, including the manufacturer's name and the instrument model number.

(7) Mass loss should be plotted as a downward type curve either in mass or percent mass units.

In reporting DTA data:
(8) Give the type of instrument employed, including the manufacturer's name and the instrument model number.

(9) Report the sample preparation and dilution, and also the reference material employed.

(10) The ordinate scale should indicate the temperature difference between sample and reference sample $T = TS - TR$. Preferred plotting for endothermic reactions consists of downward deflection of the curve peaks, and exothermic reactions as upward deflections. In addition, authors must make clear the sign convention they are using.

In reporting DSC data:

(11) Give the type of instrument employed, including the manufacturer's name and the instrument model number.

(12) The ordinate scale should be described in power or units. Plotting for endothermic reactions is as upward deflection of the curve peaks, and exothermic reactions as downward deflections. In addition, authors must make clear the sign convention they are using.

Other thermal analysis techniques:

(13) Give the type of instrument employed, including the manufacturer's name and the instrument model number.

(14) The ordinate scale should be accurately described in the preferred units of measurement.

Quantities and units
- Length $l$: metre (m)
- Mass $m$: kilogram (kg); gram (g)
- Time $t$: second (s); minute (min); hour (h)
- Thermodynamic temperature $T$: kelvin (K)
- Celsius temperature $t$: degree Celsius ($°C$)
- Amount of substance $n$: mole (mol)
- Molar mass $M$: (kg mol$^{-1}$)
- Concentration (amount) $c$: (mol dm$^{-3}$); (mol l$^{-1}$)
- Molality $m$: (mol kg$^{-1}$)
- Pressure $p$: pascal (Pa)
- Energy $E$: joule (J)
- Heat $q$, $Q$: joule (J)
- Power, heat flow rate $P$, $F$: watt (W)
- Volume $V$: (m$^3$); litre (L)
- Chemical potential (partial molar Gibbs energy): (_J mol$^{-1}$)
- Viscosity: dynamic $\eta$ (Pa s); kinematic (_ms$^{-1}$)

Subscripts to denote a chemical process:

Superscripts for standard conditions
- or °

Examples: $p_\_ = 105$ Pa (1 bar)

DcH$_\_$

$\text{HBH}_\_$ (standard partial molar enthalpy of substance B)

Prefixes
- $10^{-1}$ d; $10^{-2}$ c (centi); $10^{-3}$ m (milli); $10^{-6}$ _ (micro); $10^{-9}$ n (nano); $10^{-12}$ p (pico); $10^{-15}$ f (femto); $10^{-18}$ a (atto); $10^{1}$ da (deca); $10^{2}$ h (hecto); $10^{3}$ k (kilo); $10^{6}$M (mega); $10^{9}$ G (giga);
- $10^{12}$ T (tera); $10^{15}$ P (peta); $10^{18}$ E (exa)

Special recommendations for thermal analysis
(International Confederation for Thermal Analysis and Calorimetry, ICTAC)

Differential scanning calorimetry: DSC
Differential thermal analysis: DTA
Dynamic mechanical analysis: DMA
Thermogravimetry/thermogravimetric analysis: TG/TGA
Thermomechanical analysis: TMA
Average heating rate: beta (K min$^{-1}$)
Fractional extent of reaction: alpha
Subscripts
S, sample; R, reference sample.
To denote characteristic temperatures: i, initial; e, extrapolated onset; p, peak; f, final, g, glass transition.
When labelling the axes of graphs, symbols and units must be used as follows in order to have dimensionless data on the axes.
Examples
T/K or Tin K
(or temperature in K)
103 T/K
m/kg or m in kg
(or mass in kg)
ln (p/MPa)
P/W or P in W
(or heat flow rate in W)
do not write T(K) or T[K], etc.

References

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