

Reply

NOMENCLATURE IN THERMAL ANALYSIS

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The comments made by Kocherzhinsky and Lazarev in a recent article [1] have come to the attention of the Nomenclature Committee of the International Confederation for Thermal Analysis who have asked me to make the following reply.

(1) The Committee thanks the authors for their interest and for helping to clarify the distinction between the use of the term thermal analysis in English and in Russian.

(2) Before the ICTA Nomenclature Committee issued its first report [2] in 1969, there was considerable confusion in English language publications because thermal analysis was used in two different senses:

- (a) in the classical sense mentioned by Kocherzhinsky and Lazarev, and
- (b) to cover a range of related techniques.

The Committee, for reasons given in its first report, decided to define thermal analysis to cover (b) and to try to frame a definition that would embrace other techniques as they were developed. The chronologically earlier term [3] “heating (or cooling) curves” was proposed for (a) – a recommendation that has been generally accepted in the English language. In this connection, it should be emphasised that the Committee’s recommendations refer to the English language only and that variants are often necessary in other languages where common usage precludes direct translation.

(3) The ICTA definition [4], recently accepted as definitive by IUPAC [5], of *thermal analysis* in English is “a group of techniques in which a physical property of a substance and/or its reaction product(s) is measured as a function of temperature whilst the substance is subjected to a controlled temperature programme”. Temperature, as Kocherzhinsky and Lazarev correctly state [1], is not a physical property but is a variable of state.

With hindsight, the Committee recognises that it might have been preferable to define thermal analysis as “a group of techniques in which a variable of state or a physical property of a substance and/or its reaction product(s) is measured as a function of temperature whilst the substance is subjected to a controlled temperature programme”. It is understood that the results obtained refer only to the particular sample of the substance investigated under the specific experimental conditions employed.

(4) The definition of heating curve determination given by Kocherzhinsky and Lazarev [1] is not the full definition given in the recommendations [4,6] but a projection from a general statement. The ICTA definition states: "*Heating curve determination. A technique in which the temperature of a substance is measured as a function of the programmed temperature whilst the substance is subjected to a controlled temperature programme.*".

The Soviet National Committee on Thermal Analysis defines [1,7] heating curve determination (direct TA) as "a technique in which the temperature of a substance is measured as a function of time". Since the time axis can readily be converted to programmed temperature from the time/temperature relationship implicit in programming, the difference between the ICTA and USSR definitions is not as great as suggested by Kocherzhinsky and Lazarev.

In other ICTA definitions, the word "temperature" is deliberately not qualified as, although the temperature of the sample is the correct one to use, the actual temperature quoted may vary for different instruments and experimental conditions.

REFERENCES

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- 2 R.C. Mackenzie et al., *Talanta*, 16 (1969) 1227.
- 3 L. Palazzi and A. Batelli, *Att. Accad. Sci. Torino*, 19 (1883-84) 674.
- 4 R.C. Mackenzie, *Thermochim. Acta*, 28 (1979) 1; *J. Therm. Anal.*, 13 (1978) 387.
- 5 *Pure Appl. Chem.*, 57 (1985) 1737.
- 6 G. Lombardi, *For Better Thermal Analysis*, 2nd edn., ICTA, Rome, 1980, p. 20.
- 7 *Zh. Neorg. Khim.*, 29 (1984) 2170.