

## NOMENCLATURE IN THERMAL ANALYSIS, PART III

The recommendations in the First Report of the Nomenclature Committee of the International Confederation for Thermal Analysis (ICTA) [1] have now been approved by IUPAC [2] and ASTM [3] and the Second Report [4] has been submitted to both bodies. The interest engendered by these reports is evidenced by the fact that the Sub-Committees dealing with the French [5] and Japanese [6] languages have published definitive documents based on the First Report and versions of one or both have appeared in Czech [7], Italian [8], Japanese [9], Polish [10], Rumanian [11] and Slovenian [12].

The Council of ICTA have directed that this Third Report, approved in Business Session at the Fourth International Conference on Thermal Analysis at Budapest, Hungary, in July 1974, be published as a definitive document with the request that the recommendations therein be adhered to in all publications in the English language. The Committee are currently considering thermoanalytical techniques not so far examined in detail and hope to submit a report on these to the Fifth International Conference in Japan in 1977.

### **I. Amplification of the first report**

The definition of *differential scanning calorimetry* in the First Report applies only when power-compensation instruments are used and no definition has been proposed to cover the use of heat-flux instruments: in French the two have been clearly distinguished [5]. The Committee also recognize that there has over the past few years been increasing use of differential thermocouples for measurements under isothermal external conditions. It is therefore recommended that the following two terms and definitions be added to those in the First Report:

*Quantitative differential thermal analysis (quantitative DTA).* This term covers those uses of DTA where the equipment is designed to produce quantitative results in terms of energy and/or other physical parameters.

The record should be plotted in the same manner as a normal DTA curve.

*Differential thermal analysis (DTA) in an isothermal environment.* A variant of DTA in which the temperature difference between a substance and a reference

material is continuously recorded against time as the two specimens are maintained in a nominally isothermal environment.

The record should be plotted in the same manner as a normal DTA curve.

The term isothermal DTA is incorrect and the abbreviation QDTA is not considered to be warranted.

## II. Multiple techniques

In view of recent developments, the brief comments on *multiple techniques*, simultaneous and combined, in the First Report require clarification and the following names and definitions have been approved.

*Simultaneous techniques.* This term covers the application of two or more techniques to the same sample at the same time — e.g. simultaneous thermogravimetry and differential thermal analysis.\*

*Coupled simultaneous techniques.* This term covers the application of two or more techniques to the same sample when the two instruments involved are connected through an interface\*\* — e.g. simultaneous differential thermal analysis and mass spectrometry.

*Discontinuous simultaneous techniques.* This term covers the application of coupled techniques to the same sample when sampling for the second\*\*\* technique is discontinuous — e.g. discontinuous simultaneous differential thermal analysis and gas chromatography, when discrete portions of evolved volatile(s) are collected from the sample situated in the instrument used for the first\*\*\* technique.

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\* In writing, the names of simultaneous techniques should be separated by 'and' when used in full and by a hyphen when abbreviated acceptably — e.g. simultaneous TG-DTA. Unless contrary to established practice, all abbreviations should be written in capital letters without full-stops.

\*\* A specific piece of equipment that enables two instruments to be joined together.

\*\*\* In coupled simultaneous and discontinuous techniques, the first technique to be mentioned is that in which the first, in time, measurement is made — e.g. when a DTA instrument and a mass spectrometer are connected through an interface, DTA-MS is the correct form, not MS-DTA.

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### References

1. *Talanta*, 16 (1969) 1227; *J. Macromol. Sci.*, A4 (1970), 1015; *J. Polym. Sci., Polym. Lett. Edn*, 12, (1974) 523.
2. *Pure Appl. Chem.*, 37 (1974) 439.
3. "Annual Book of ASTM Standards", ASTM, Philadelphia, USA, 1973, Pt 41, E473–73.
4. *Talanta*, 19 (1972) 1079; *J. Thermal Anal.* 4 (1972), 343; *Thermochim. Acta*, 5 (1972), 71.
5. *Analysis*, 2 (1973); 459; *Actualité chim.*, No.4, (1973) 35; *J. Thermal Anal.*, 6 (1974) 241.
6. *Calorim. therm. Analysis Newsl.*, 2, (1971) 45.
7. *Silikáty*, 12 (1968), 377.
8. ICTA Gruppo Italiano: *Notiziario ital.*, 1972, No. 9, 3; No. 10, 2.
9. *Calorim. therm. Analysis Newsl.*, 1 (1970), 22; 2 (1971), 62.
10. *Przegl. geol.*, 21 (1973) 42.
11. *Rvťa Chim.*, 24 (1973), 822.
12. *Vest. slov. kem. Društ.*, 20 (1973) 51.