

# Certificate

## NBS-ICTA Standard Reference Material 759 DTA Temperature Standards (295 – 675 °C)

These standards include: analyzed reagent silver sulfate, potassium sulfate, potassium chromate; commercial grade potassium perchlorate; and natural quartz. They are for use in calibrating the temperature scale on differential thermal analysis and related thermoanalytical equipment under operating conditions. They are to be used only in the heating mode.

### Transition Temperature Data (°C)

Material	Equilibrium Value [1]	DTA Mean Values	
		Extrapolated Onset	Peak
KClO <sub>4</sub>	299.5	299	309
Ag <sub>2</sub> SO <sub>4</sub>	(*)	424	433
SiO <sub>2</sub>	573	571	574
K <sub>2</sub> SO <sub>4</sub>	583	582	588
K <sub>2</sub> CrO <sub>4</sub>	665	665	673

(\*)The value for the transition temperature reported for this material [1] is currently under review. A more recent value of 430 °C has been reported [2].

The extrapolated onset temperature is defined (Point A, Figure 1) as that temperature found by extrapolating the base line, prior to the peak, and the leading side of the peak to their intersection. The peak temperature (Point B, Figure 1) is defined as the temperature corresponding to the point of maximum deflection of the differential temperature curve.

Based on the mean value from 34 cooperating laboratories, the standard deviation was 5.8 °C, which includes the bias among laboratories as well as measurement errors. In the heating mode, onset and peak temperatures have about equal precision. However, the mean extrapolated onset temperatures are closer to the equilibrium transition temperatures.

The materials for these standards were furnished by the Committee on Standardization of the ICTA.

The International Test Program leading to the data on which certification is based was coordinated by H. G. McAdie, Chairman, ICTA Committee on Standardization.

Coordination of efforts leading to certification by NBS was under the chairmanship of O. Menis.

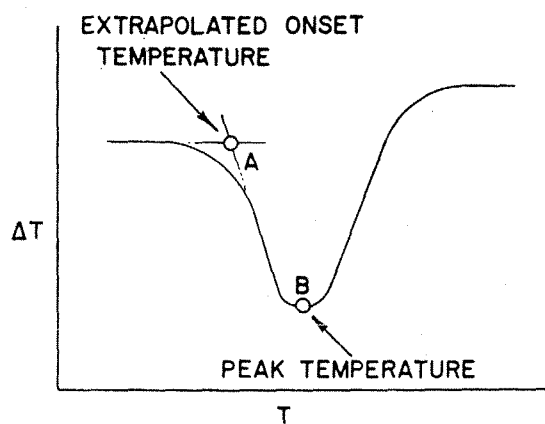
The technical and support aspects involved in the preparation, certification, and issuance of these Standard Reference Materials were coordinated through the Office of Standard Reference Materials by T. W. Mears.

Washington, D. C. 20234  
 June 11, 1971

J. Paul Cali, Chief  
 Office of Standard Reference Materials

(over)

The transition temperatures given are the means of values obtained on 28 different types of commercial or custom-made instruments, and do not necessarily agree with the equilibrium values [1, 2]. Generally, values from DTA are somewhat higher than the equilibrium values and vary in a complex manner for different instruments and heating rates. Details of the instruments used, the test conditions and complete data will be given in an NBS Special Publication in the 260 series (in publication).



- [1] Nat. Bur. Stand. (U.S.), Circ. 500 (1952).
- [2] Hedvall, J. A., Lindner, R., and Hartler, N., Acta. Chem. Scand. 4, 1099 (1950).

Cooperating Laboratories

- Dr. David E. Baum, Monsanto Australia Limited, West Footscray, Victoria, Australia
- Prof. Marcel Bourgon, Université de Montréal, Montréal, Quebec, Canada
- Dr. H. G. McAdie, Ontario Research Foundation, Sheridan Park, Ontario, Canada
- Dr. Klaus Heide, Friedrich-Schiller-Universität, Jena, Germany
- Dr. J. Wiegmann, Berlin, Germany
- Dr. G. R. Cizeron, Université de Paris, Paris, France
- Dr. M. Harmelin, C.N.R.S., Paris, France
- Mme. J. Jegoudez, Université de Paris, Paris, France
- Dr. M. Foldvari, Hungarian Geological Institute, Budapest, Hungary
- Mr. J. Paulik, Technical University of Budapest, Budapest, Hungary
- Prof. H. Kambe, University of Tokyo, Tokyo, Japan
- Prof. C. Kato, Waseda University, Tokyo, Japan
- Prof. K. Oinuma, Tokyo University, Tokyo, Japan
- Prof. R. Otsuka, Waseda University, Tokyo, Japan
- Mr. J. E. Kruger, National Building Research Institute, Pretoria, South Africa
- Dr. R. S. Forsyth, Aktiebolaget Atomenergi, Studsvik-Nyköping, Sweden
- Dr. G. Krien, Institut für Chemisch-Techn. Untersuchungen, Leverkusen, Germany
- Prof. H. R. Oswald, Universität Zurich, Zurich, Switzerland
- Dr. T. Peters, Universität Berne, Berne, Switzerland
- Dr. H. G. Wiedemann, Mettler Instrumente A. G., Greifensee, Switzerland
- Prof. L. G. Berg, Gosuniversitet, Kazan, U.S.S.R.
- Prof. E. K. Kochler, Academy of Sciences of the USSR, Novosibirsk, USSR
- Dr. I. S. Rassonskaya, Institut Obshchei i Neorganicheskoi Khimii, Moscow, USSR
- Dr. G. O. Piloyan, Academy of Sciences of the USSR, Moscow, USSR
- Mr. E. L. Charsley, Stanton Rederoft Limited, London, England
- Dr. R. C. Mackenzie, The Macaulay Institute for Soil Research, Aberdeen, Scotland

Prof. D. A. Smith and Mr. J. Youren, Queen Mary College, University of London, London, England

Dr. P. K. Gallagher, Bell Telephone Laboratories, Murray Hill, N.J., U.S.A.

Prof. P. D. Garn, University of Akron, Akron, Ohio, U.S.A.

Dr. O. Menis, D. S. Bright, and J. T. Sterling, National Bureau of Standards, Washington, D.C., U.S.A.

Mr. T. D. Oulton, Englehard Minerals & Chemicals Corp., Edison, N.J., U.S.A.

Dr. R. K. Ware, Owens-Illinois, Toledo, Ohio, U.S.A.

International Confederation for Thermal Analysis Committee on Standardization:

Chairman		(Canada)	H. G. McAdie
Vice-Chairman		(U.S.A.)	P. D. Garn
Secretary		(U.K.)	R. C. Mackenzie
National Delegates		(France)	C. Mazieres
		(German D.R.)	K. Heide
		(Hungary)	F. Paulik
		(Japan)	H. Kambe
		(Sweden)	R. S. Forsyth
		(Switzerland)	H. G. Wiedemann
		(U.S.S.R.)	I. S. Rassonskaya
		(U.K.)	D. A. Smith
		(U.S.A.)	R. W. Pfeil
Representative Delegates	ASTM	(U.S.A.)	Vacant
	ISO		Vacant
	NBS	(U.S.A.)	O. Menis
	Soc. Anal. Chem.	(U.K.)	C. J. Keatch
	SAMA	(U.S.A.)	Vacant
Ex-Officio Delegates	ICTA	(U.S.S.R.)	L. G. Berg
		(U.S.A.)	C. B. Murphy
		(U.K.)	R. C. Mackenzie
		(U.K.)	J. P. Redfern