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THE CONFERENCES ON VACUUM MICROBALANCE TECHNIQUES +

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The development of microbalances can be divided into three principal categories depending on the application of these instruments. First, the chemical microbalance, which may be a beam, spring, or cantilever balance of highest sensitivity, responds to a change in mass. Second, the thermobalance, which is usually an automated beam balance, is characterized by the measurement of time dependent mass changes due to a programmed thermal treatment of the sample. Finally, the vacuum microbalance is usually used for continuously measuring time dependent mass changes due to reactions of the sample with the gas phase (e.g., adsorption, desorption, oxidation, reduction, decomposition, etc.). Whereas thermobalances can be simple modifications of ordinary analytical balances, the vacuum microbalance must be suitable for high vacuum as well as for corrosive atmospheres. Thus, the vacuum microbalances developed are quite different in most cases from analytical balances and their automation is generally based on electronic methods [1]. Adaptation of custom-made balances to vacuum, the development of electronic balances, and determining the origin of many artifacts dominated the decade (1955–1965) when there was a major expansion of microbalance activity. In 1960, the Conferences on Vacuum Microbalance Techniques (VMT) were begun. Since that time, ad hoc conferences have been organized by interested participants and without sponsorship by a technical society or an interested commercial enterprise. The VMT Conferences held to date and the sources of the proceedings are listed in Table 1. In most cases, the organizer of a conference has also served as editor of the proceedings (see footnote ** at bottom of Table 1). During the 1972 Conference, a continuation Steering Committee was formed with A.W. Czanderna and E. Robens as co-chairmen. Since that time, the conferences have been organized alternately in the USA and in Europe. The American Conferences have been incorporated as one or two sessions of the annual National Symposium of the American Vacuum Society. The European Conferences have continued to be held independently except for the 16th Conference, which was arranged on short notice in cooperation with the German and the Danish Society for Thermal Analysis when a conference planned for Hungary could not be held there.

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The interaction of the participants at the 6th Conference led to the first treatise on vacuum microgravimetry [2], which is now out-of-print. Part of ref. 2 is included in the recent book edited by A.W. Czanderna and S.P. Wolsky [1]. The ten chapters in ref. 1, with 882 references, plus the proceedings issues of the eighteen conferences given in Table 1 constitute a significant reservoir of information for anyone using a vacuum microbalance or related techniques.

Future VMT Conferences are planned for November 16–19, 1982 in Baltimore, MD, USA in connection with the National Symposium of the American Vacuum Society, and from August 31–September 2, 1983 at Plymouth, U.K. with S.A.A. Jayaweera as the Conference Chairman.

REFERENCES

1 A.W. Czanderna and S.P. Wolsky, in A.W. Czanderna and S.P. Wolsky (Eds.), Microweighing in Vacuum and Controlled Environments, Elsevier, Amsterdam, 1980, pp. 1–57.
2 S.P. Wolsky and E.J. Zdanuk (Eds.), Ultra Micro Weight Determination in Controlled Environments, Wiley, New York, 1969.

TABLE 1

Pertinent data about conferences on Vacuum Microbalance Techniques

Conference No.	Year	Location	Literature Reference for Proceedings*
1	1960	Fort Monmouth, NJ, USA	M.J.Katz (Ed.), VMT, Vol. 1, Plenum, NY, 1961.
2	1961	Washington, DC, USA	R.F. Walker (Ed.), VMT, Vol. 2, Plenum, NY, 1962.
3	1962	Los Angeles, CA, USA	K.H. Behrndt (Ed.), VMT, Vol. 3, Plenum, NY, 1963.
4	1964	Pittsburgh, PA, USA	P.M. Waters (Ed.), VMT, Vol. 4, Plenum, NY, 1965.
5	1965	Princeton, NJ, USA	K.H. Behrndt (Ed.), VMT, Vol. 5, Plenum, NY, 1966.
6	1966	Newport Beach, CA, USA	A.W. Czanderna (Ed.), VMT, Vol. 6, Plenum, NY, 1967.
7	1968	Eindhoven, The Netherlands	C.H. Massen and H. Van Bechum (Eds.), VMT, Vol. 7, Plenum, NY, 1970.
8	1969	Wakefield, MA, USA	A.W. Czanderna (Ed.), VMT, Vol. 8, Plenum, NY, 1971.
9	1970	Berlin, West Germany	Th. Gast and E. Robens (Eds.), PVMT, Vol. 1, Heyden, London, 1972.
10	1972	Uxbridge, U.K.	S.C. Bevan, S.J. Gregg, and N.D. Parkyns (Eds.), PVMT, Vol. 2, Heyden, London, 1973.
**11	1973	New York, NY, USA	J. Vac. Sci. Technol., 11 (1974) 396-439.
**12	1974	Lyon, France	C. Eyraud and M. Escoubes (Eds.), PVMT, Vol. 3, Heyden, London, 1975.
**13	1975	Philadelphia, PA, USA	J. Vac. Sci. Technol., 13 (1976) 541-560.
**14	1976	Salford, U.K.	D. Dollimore (Ed.), Thermochimica Acta, 24 (1978) 204-431.
**15	1977	Boston, MA, USA	J. Vac. Sci. Technol., 15 (1978) 745-821.
**16	1978	Kiel, West Germany	O.T. Sørensen (Ed.), Thermochimica Acta, 29 (1979) 198-360.
**17	1979	New York, NY, USA	J. Vac. Sci. Technol., 17 (1980) 90-124.
**18	1981	Antwerp, Belgium	E. Robens (Ed.), Thermochimica Acta, This Volume.

*VMT, Vacuum Microbalance Techniques and PVMT, Progress in Vacuum Microbalance Techniques are the titles of books.

**Conference organizers were: 11, A.W. Czanderna; 13, W. Kollen; 15, P. Ficalora; 16, H.-J. Seifert and O. Toft Sørensen; 17, A.W. Czanderna; and 18, R. De Batist and A. Van den Bosch. All papers published were peer reviewed.