

## BOOK REVIEW

**Boiling Phenomena**, Edited by Sjoerd van Stralen and Robert Cole, Hemisphere Publishing Corp., McGraw-Hill, New York (1979), Volumes I & II, 945 pp.

To a great extent, these two volumes represent the collected works of Dr. van Stralen, senior research scientist of Eindhoven University. He had previously published some 85 papers, 16 of which were entitled "Boiling Phenomena". In these new volumes, over 550 pages are by van Stralen and his coauthors. Important additional contributions came from 15 selected authors who contributed 18 chapters (one as short as 7 pages) on their particular specialties. The greatest help was provided by Prof. Cole of Clarkson University who spent a sabbatical leave at Eindhoven and wrote 4 chapters.

Some 20 years ago, a flurry of research on the origin and growth of bubbles during nucleate boiling arose in numerous laboratories. It was hoped that this microscopic approach would lead to a break-through. The goal was to develop methods for the design of commercial heat exchangers for boiling liquids by use of a knowledge of bubble dynamics. Most of the early workers gradually have abandoned that broad goal. For example, recent books by L. S. Tong of Westinghouse and by Y. Y. Hsu and R. W. Graham of NASA emphasize the macroscopic view of boiling and devote minor space to bubble behavior.

Not van Stralen. He adopts the microscopic viewpoint. Most of the tests included in these new volumes were obtained by use of single hot wires (or hot ribbons) in a small pool of liquid. A vast amount of data is given concerning bubble behavior. Much of it was obtained using high speed motion pictures. Finally in the last chapter, based on a 1976 doctoral thesis by G. H. Niels, a design equation for kettle evaporators is established. It contains bubble frequency, bubble waiting period, bubble growth time, renewal frequency and other parameters. The authors concludes that the equation is "unsuitable for engineering purposes". Therefore, those interested in design work will not be much attracted to these volumes. However, those who are interested in bubble nucleation and bubble growth and particularly those who want to know everything about boiling on small wires will find it all here.

The index is helpful but not thorough. For example, Nukiyama, Kutateladze, Rohsenow and Zuber cannot be found by looking under their names. Some of their works are listed under other labels or are presented in the body of these volumes but not in the index. On the other hand, some less well known persons such as van Ouwkerk and Bruijn are listed. A more serious omission in the volumes is any identification of the various contributing authors other than van Stralen and Cole. For the others, no mention is made of their present or past affiliations.

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