

BOOK REVIEW

Technical Thermodynamics. FRAN BOŠNJAKOVIČ, Holt, Rinehart and Winston, New York, 1965, 524 pp.

It is the exceptional treatment of the thermodynamics that gives substantial attention to the useful potentialities of the second law. Generally, after a very labored initial development, the second law and its principally derived functions, entropy, are relegated to a very subordinate role. The two-volume work by Bošnjakovič, the second volume of which has been translated and is the subject of this review, is a most refreshing exception.

Major attention is given in this work to the analysis of processes involving phase change and chemical reactions. The usual analysis of such processes, particularly in American publications, proceeds first by developing an energy or first law balance, then the implications of the second law are used to establish equilibrium criteria, and finally the efficiency of the process is assessed on the basis of utilization of energy. A more sophisticated treatment will occasionally relate energy transfer occurring to the extremes permitted by the second law. However, in all cases attention is directed primarily to the first law analysis.

Bošnjakovič introduces systematically a very desirable balance by presenting analytically and particularly graphically parallel examinations of processes by both the first and second law. To emphasize the fact that different considerations are involved in these two cases, the first law analysis makes systematic use of enthalpy as the energy function, while

the second law analysis makes use of entropy. The graphical representation of various processes involving phase change and chemical reaction is a significant feature of this work. As is often the case the well designed graphical description presents compactly much more information than conventional analysis. The use of these charts in depicting quantitatively the effect of irreversibilities in process operations is extremely well done. Combined charts involving enthalpy, entropy as well as extent of phase or chemical reactions are effective in even very complex situations.

Approximately two-thirds of the work deals with phase reactions. These include various evaporation processes as well as an unusually thorough treatment of absorption refrigeration. The latter portion treats chemical reactions. The systematic use of extent of reactions as parameter permits a direct treatment even for multicomponent systems.

It is difficult to compare this treatment with the usual approach by American authors. Only one current text, *Engineering Thermodynamics* by Hall and Ibele, makes use of the methods of presentations adapted. Most chemical engineers will be so unfamiliar with the concepts that they will reject the book without assessing the substantial benefit provided for many of their problems. One minor usage of the author will confuse many. The accepted symbol for enthalpy is the letter h , the author's, i , is unfortunate.

The translation is well done and long overdue. The first volume should also be made available in English.

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