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Book Review

The Corresponding-States Principle and its Practice: Thermodynamic, Transport and Surface Properties of Fluids. By Hong Wei Xiang, Elsevier, Amsterdam. September 15, 2005, 231 pp. ISBN0-444-52062-7

In the autumn of 2005, a new monograph on corresponding states became available. Although very concise, it is impressive, as it covers many areas of corresponding-states principles and applications comprehensibly. Furthermore, emphasis is given to the application of new generalized extended corresponding-states schemes, which are superior to older formulations. These results are of considerable practical importance and value to the field of thermophysics. The monograph was designed to assist both the generators and users of thermophysical properties data.

My general impression is that "The Corresponding-States Principle and its Practice" is a very interesting source book, of significant value not only to thermophysicists, but also to all engineers or scientists who need to predict properties. Methods presented and derived in this book are expected to be of value for the calculation of the thermophysical properties of gaseous, liquid, and solid states of matter, in most ranges of temperature, pressure, density, and other relevant variables.

The book is organized into two parts, a theoretical and a more practical one. The first chapter is a brief overview of corresponding-states theory and properties of matters. Chapters 2 – 4 discuss analytically and comprehensibly the current state of the art in the theory of corresponding-states. More particularly, in Chapter 2, the van der Waals corresponding-states theory related to the fluid continuity of the van der Waals equation of state is introduced. The theoretical basis of the corresponding-states principle, for spherical and nonspherical molecules, is explained in Chapter 3. Parameters of corresponding states models and the basic form of corresponding-states properties are described in Chapter 4. The next four chapters are more focused on corresponding-states applications. Hence, corresponding states applied to thermodynamic property calculations, along with comparisons with recommended data, and, in particular,

vapor pressure, are presented in Chapters 5 and 6. Chapter 7 demonstrates the application of the corresponding states principles to the prediction of viscosity and thermal conductivity, while surface tension is discussed in Chapter 8.

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