

capric acid in ethylene is about  $3 \times 10^{-8}$  g/dm<sup>3</sup>. If the ethylene pressure is increased to about 8 MN/m<sup>2</sup>, the capric acid concentration in the gas phase increases to 7 g/dm<sup>3</sup>—an increase of some  $2 \times 10^8$  fold! Authors Paul and Wise cite many such cases in this book to emphasize the significant increase in solubility when the gas phase is at high pressure and a low temperature, that is, near or below its critical point. In addition, they note some industrial applications, an example of which is the use of dense methane or ethylene for stripping coal tar or de-asphalting. Finally, the authors explore the possibility of employing dense gas extraction in biological chemical purifications, polymer separation, desalination, chromatography, and other processes wherein high temperatures are detrimental. In pointing out the possible applications of the technique, the book is valuable, though not exhaustive, for example, no mention is made of the phenomenon's importance in cryogenic gas purification processes.

The theoretical foundation laid for understanding the phenomenon and for actually estimating the enhancement of solubility is too brief, and some of the estimation techniques are out of date. Readers unfamiliar with the area will unfortunately have to return to the original literature.

Despite its shortcomings, however, the monograph is easy to read, provocative in suggesting new applications for this phenomenon, and will be well worth the few hours spent in reading it thoroughly.

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**New Energy Technology—Some Facts and Assessments**, H. C. Hottel and J. B. Howard, MIT Press, Cambridge, Mass. (1972). 364 pages. \$2.95.

The authors are recognized authorities in the engineering sciences and are well qualified to present the current status of the energy crisis.

The introduction and summary are worth the price of the book. An excellent and concise presentation of the energy needs of the United States and the world is given along with the supplies available from gas, oil, coal, and nuclear power. Per capita consumption of energy in the United States if equaled by the rest of the world "will require the effective contribution of the scientist, the engineer, the economist, the industrialist, and the statesman."

Energy sources, transportation, and environmental effects are adequately

covered. The effects of energy production on the environment are given from an engineering background and hence, the problems are placed in a perspective not dominated by hysteria.

The chapter on fossil fuel-to-fuel conversion is an excellent summary of the processes available at present for conversion of coal, oil, shale, and tar sands to high BTU gas and oil. Research needs for each source of energy supply are appropriately set forth and constitute a needed addition to the literature. The authors state: "a final choice of process that saves 10¢/1,000 cu. ft in manufacturing cost will, in the days when our consumption of synthetic pipeline gas is one-third that of natural gas in 1970, amount to a saving of \$750 million per year." This chapter contains only a minimum amount of theory on coal gasification. Expansion of this section would be welcomed.

Sulfur-free fuels from coal that can be used in gas turbines to produce power are also recommended for consideration because of the shortcomings encountered with sulfur dioxide cleanup of power stack gases. Sixteen processes for sulfur dioxide removal from stacks are listed. The author states that sulfur dioxide pollution is a local problem and not a global problem because of the short life of sulfur dioxide in the atmosphere.

Nuclear generated electric power is expected to rise from  $6 \times 10^3$  MW in 1970 to  $735 \times 10^3$  MW in the year 2,000. The authors' discussion is comprehensive for the many different types of reactors, including the breeder variety. However, very little is said about nuclear fusion as a source of power. A reader will find a thorough discussion of the safety problem and disposal problems associated with spent nuclear fuel.

Finally, because of the vast amount of power consumed by the automobile and by home heating and air conditioning, the prospects of energy sources for these purposes is covered, including a comprehensive discussion of solar energy, which is not expected to contribute significantly to our energy needs. "Until new knowledge is available, studies of large-scale power from the sun via the flat-plate collector are a waste of time and money. The need is for cheaper collectors and for better photovoltaic cells." The latter appears to be "the only hope for solar power."

The book is a much needed contribution to the literature on our energy problems.

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## Letters (con't.)

for 1,000 points in the temperature interval  $T_r = 0.7 \div 2.6$  and pressure  $P_r = 0.1 \div 5$ . For the calculation the computer "Minsk-22" was used. One hundred isotherms were tested, each containing 10 points. The mean square deviation for every isotherm was taken as a measure of the correlation quality.

It was very easy to establish the striking effect of the temperature on the accuracy of all the correlations: at all pressures the RKA is the best up to  $T_r = 1.4$ . Above this temperature the best is the RK, but even here the RKA is not far behind.

Only for 10 isotherms was the RKZ slightly better than two others. Unfortunately for many other isotherms the deviations obtained for the RKZ are too great: 10 times and more than for the RKA and RK.

Now we consider that it might be rather sensible to use the RKA in the Chao-Seader method instead of the original RK.

## LITERATURE CITED

1. Reid, R. C., and T. K. Sherwood, *The Properties of Gases and Liquids*, McGraw Hill, N. Y. (1966); Russ. edit., Leningrad (1971).
2. Redlich, O., F. J. Ackerman, et al., *Ind. Eng. Chem. Fundamentals*, **4**, 369 (1965).
3. Gray, R., N. H. Rent, and David Zudkevitch, *AIChE J.*, **16**, 991 (1970).
4. Rowlinson, J. S., *Liquids and Liquid Mixtures*, Butterworths, London (1969).
5. Tang, W. K., *Assembled Tables of PVT-Data*, Univ. Wisc. Madison (1956).

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## TO THE EDITOR:

The Design Institute for Multiphase Processing (DIMP) which was discussed in the March editorial is, like many Institute activities, the product of considerable volunteer effort. Several people not currently associated with the program played key roles in advancing DIMP from inspiration to reality. In this connection we wish to acknowledge the foresight and effort of G. E. Alves and Dr. H. S. Kemp of DuPont and Dr. G. D. Towell of Shell.

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