

Stull D R Vapor pressure of pure substances.

Ind. Eng. Chem. **39**:517-50, 1947.

The increasing importance of vapor pressures prompted the author to assemble as much of this information as he could locate. Data on over 1200 organic compounds, and about 300 inorganic compounds from various sources were collected, weighed, and presented in the accompanying tables. [The SCI[®] indicates that this paper has been cited over 260 times since 1961.]

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"Earth's molecules exist as solid, liquid, and gas (vapor): for example, ice, water, and steam. Vapor pressures are generated by the dynamic equilibrium of the solid and/or liquid form with the vapor form, and material is constantly transferring both ways between the vapor and the condensed phase. Vapor pressures range from virtually zero at absolute zero and increase with increasing temperature to a maximum value at a terminal or critical temperature above which the condensed phase can no longer exist. With increase of temperature there is an increased tendency for solid molecules to escape as liquid or vapor and for liquid molecules to escape as vapor. This 'escaping tendency' is generated by the chemical and physical activity of every substance and is related to the pressure of the vapor. Thus, the vapor pressure is an important numerical in-

dex to the behavior of materials throughout science.

"From the measurement of the vapor pressure of water in college physical chemistry, I was impressed by the usefulness of vapor pressures in technology. My work with the Dow Chemical Company required the precision measurement of vapor pressures. Special graphs, 56 x 39 inches in size, were used to plot logarithmic vapor pressures versus the Cox reciprocal temperature scale, $1/[+(_ C) + 230]$. To avoid duplication, a literature search was made for data. During 1943 and 1944 at home evenings, the data were evaluated and tabulated at fixed pressures. The tabulation became the subject of a Dow report and was later published for general use. Since publication more than 4000 copies have been provided gratis on request. Although they are now out of print, they have been reprinted in a few other places. These tables helped to answer with dispatch industrial questions about vapor pressure directed to me.

"Having retired, I am updating the 1947 tables. The Dow Chemical Company has kindly made their excellent library available. Working alone at a job of my own choice, at my own pace, is a satisfying task. Now it would help me immensely if everyone who is measuring vapor pressures would send me a copy of his/her work. My own chemical education was a mosaic put together by many chemists before me, and I feel obliged to add as much to the chemical fund of knowledge as I can."