

THE CHEMISTRY OF THE HEPTANE SOLUTION.*

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This investigation has grown out of the phytochemical studies of two California pines, *viz.*, *Pinus sabiniana* and *Pinus Jeffreyi*; and, subsequently, out of the desire to introduce heptane as a solvent for a variety of purposes. One of the uses to which heptane was put was that of a vaporizer of water in moisture determinations according to one of the modifications of the so-called xylene method. In this application it soon became apparent that heptane, like xylene, might serve an additional purpose. Since it is a highly selective solvent, the use of an excess of heptane enables the investigator to test for a variety of substances in a preliminary manner. In order to know what substances might be tested for, it became necessary to acquire a better knowledge of the solubility of a large variety of substances, not only of those found in plants, but of chemicals in general. In order to supplement the range of substances more readily soluble in hot than in cold heptane, *viz.*, those that might be expected to crystallize out upon cooling after the completion of the moisture determination by a knowledge of those that might be expected to remain in solution, an extension of the work originally contemplated had to be undertaken.

While it is quite feasible, in part, to test this heptane solution with the ordinary reagents in aqueous solution, the desirability to test the heptane solution with reagents also in heptane solution soon presented itself. This lead almost immediately to striking results. As a matter of fact, the results soon became so numerous that they threatened to confuse. Hence, a systematic survey was undertaken, which yielded new data at every turn. A mere attempt to enumerate them would require hours.

The peculiar chemistry thus opened up has been designated a "new chemistry." While it is well known that chemists have long experimented with petroleum ether and other mixtures of unknown composition, the heptane used (not the commercial mixture that sails falsely under this flag) is a definite chemical substance capable of an unusual degree of purification. Moreover, it is worth while to work quantitatively with such solutions, hence the determination of the physical and chemical constants of the solutions adds materially to the significance of the study of the chemistry of the heptane solution.

* An abstract of the subject submitted by the author at the Indianapolis meeting, A. Ph. A., 1917.