

Study Tests for Air in Gasoline

Metrology

When you stop at the filling station for five gallons of gas, are you getting all gasoline, or are you paying for part air?

The question of air dissolved in gasoline, and means of testing for its amount, was one of the problems to engage the attention of the twenty-second National Conference on Weights and Measures. It is this air in solution that makes the gas appear to boil when pumped into the glass chamber of the filling station pump, said Dr. Oscar C. Bridgeman, research associate at the Bureau of Standards for the Society of Automotive Engineers.

"When a gasoline direct from the stills at a refinery is exposed to the air on storage in a tank fitted with a vent hole, a considerable amount of air may go into solution," said Dr. Bridgeman. "This air in solution cannot be seen for it is so finely subdivided that it is invisible. If the gasoline warms up, some of the dissolved air will collect in the form of bubbles and rise to the surface, for the solubility of air decreases as the temperature increases. When a gasoline is stored under air pressure, more air will dissolve than when exposed to the atmosphere, for the solubility of air increases with the air pressure above the gasoline.

"Two methods can be used for the experimental determination of the solubility of air in gasolines. In the first method, a sample of the gasoline, previously exposed to the air, is analyzed and the amount of air in solution is measured. In this analysis the air in solution is pumped off into a graduated vessel by means of a vacuum pump while the gasoline is kept frozen with liquid air at a temperature of about minus 300 degrees Fahrenheit.

"In the other method, the gasoline is first freed from air and then known amounts of air are added. Measurements of the air pressure above the gasoline furnish enough information to calculate the solubility. Both of these methods have been used with a number of gasolines and it

has been found that the solubility of air varies somewhat with the gravity of the gasoline.

"A volatile aviation gasoline exposed to the atmosphere will dissolve about one-quarter of its own volume of air, whereas a U. S. Motor gasoline will dissolve about one-sixth of its volume of air at ordinary temperatures. The change of solubility with temperature is not very large, but a doubling of the air pressure above the gasoline will approximately double the solubility.

"When the air is actually in solution in a gasoline, the volume occupied by the gasoline is not appreciably different from what it would be if there were no dissolved air in it. However, if the gasoline is saturated with air under pressure and this pressure is released, the air may form fine bubbles in the gasoline and the volume may be much larger due to these bubbles displacing some of the liquid. Hence the precise metering of gasoline must be done under such conditions that no bubbles of air are present while the liquid is passing through the meter.

"Another practical phase of the problem of dissolved air in gasoline lies in its application to the pumping of gasolines by suction lift. The height to which it is feasible to pump gasoline under these conditions is dependent not only upon the volatility of the gasoline but also upon the amount of air in solution."

Science News-Letter, June 15, 1929

In This Issue—

Test for gasoline, p. 366—*Lamb's liver*, p. 366—*Lightning rod wins*, p. 366—*Rome in Germany*, p. 367—*Hornless Rhino*, p. 369—*Ice cream cans*, p. 367—*Drug store lunch* O. K., p. 370—*X-Rays and evolution*, p. 370—*Manganese tariff*, p. 371—*Menigitis*, p. 371—*Nicotin affects milk secretion*, p. 372—*Hunt elephants*, p. 372—*Chemical secrets*, p. 373—*Ant "cowboys" faithful*, p. 373—*Sex factor in cancer*, p. 374—*Race reaction*, p. 374—*Ancient man in Florida*, p. 377—*Radio Time Signal*, p. 377.

and B Sts., N. W., Washington, D. C. Address all communications to Washington, D. C. Cable address: Scienserve, Washington.

Entered as second class matter October 1, 1926, at the postoffice at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade-mark, U. S. Patent Office.

Subscription rate—\$5.00 a year postpaid. 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Special reduced subscrip-

Lamb's Liver Anemia Cure

Medicine

Calf's liver may be a more epicurean dish, but the liver of any other domestic animal may prove as efficient in curing anemia, chemists and nutritionists declare. Young lamb's liver, judged by the amount of minerals it contains, may have a vitamin content and anemia-curing power equal to, if not superior to that of calf's liver. Investigations show considerable variation in the mineral and nitrogen content of the livers of calves, oxen, lambs, hogs, colts, chickens and rats, Prof. J. S. McHargue, W. R. Roy and F. E. Hull, of the Kentucky Experiment Station, reported to the American Chemical Society. Whether livers from these various animals can make as great an appeal to the palate as that from calves is still an open question, to be solved, perhaps, by cooks.

Science News-Letter, June 15, 1929

Lightning Rod Wins

Engineering

In the only competition known in which the utility of the elevator was weighed against that of the lightning rod, the lightning rod came out on top, according to early records of the American Philosophical Society, oldest learned society in the United States.

These records show that in 1792 two papers were submitted in competition for the Magellanic premium. One was entitled, "A New Piece of Mechanism, Called the Elevator, Designed Principally for Lifting to Great Inaccessible Heights." The other described "The Improvement of Electrical Rods, or Lightning Conductors, by Pointing Them with Black Lead."

Strange as it may seem in the light of the present day status of the two devices, the paper on the lightning rod won that year's premium. But the elevator was not to stay down for long. Two years later the elevator paper was rewarded.

Science News-Letter, June 15, 1929

Near-sighted people have a tendency to write small; whereas far-sighted people write large.



SCIENCE NEWS-LETTER, The Weekly Summary of Current Science. Published by Science Service, Inc., the Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Edited by Watson Davis.

Publication Office, 1918 Harford Ave., Baltimore, Md. Editorial and Executive Office, 21st

tion rates are available to members of the American Association for the Advancement of Science. Advertising rates furnished on application.

Copyright, 1929, by Science Service, Inc. Reproduction of any portion of the SCIENCE NEWS-LETTER is strictly prohibited since it is distributed for personal, school, club or library use only. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service, details and samples of which will be gladly sent on request.