

TECHNOLOGY

Perfect Vacuum Bottle To Store Liquid Helium

➤ A MUCH improved vacuum bottle, working on the same principle as the kind taken on picnics but used by scientists when making investigations near absolute zero, was described at a Low Temperature Symposium, Washington, D. C. Absolute zero is more than 459 degrees below zero Fahrenheit. Studies at such extremely cold temperatures give more knowledge of the atom.

Dr. Aaron Wexler, of the Westinghouse Research Laboratories, Pittsburgh, stated that the bottle can hold liquid helium 15 times longer than the best container previously available. Dr. Wexler perfected the container in collaboration with Howard S. Jacket, of Hofman Laboratories, Inc., Newark, N. J.

The new vacuum bottle will hold four gallons of liquid helium for 100 days, about 15 times longer than containers now in use. It will give a longer lasting supply of the super-cold liquid, where previously scientists often had to make their own liquid helium.

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ENTOMOLOGY

If DDT Does Not Kill Flies, Try Non-Chlorinated Chemicals

➤ WHEN DDT begins to fail in a job of fly eradicating in a community because the flies have developed resistance to it, better change to a non-chlorinated insecticide, such as parathion, sabadilla, pyrethrum, nicotine or TEPP.

This seems to be the practical suggestion from research by Drs. Richard Weiner and James F. Crow of the University of Wisconsin, Madison.

Fruit flies were used in their studies because these can be reared in large numbers in the laboratory and because more precise information on the genetics of the problem can be obtained with them than with other insects.

Fine crystals of DDT were scattered in the fly cages in gradually increasing amounts. At the end of a year, only about 5% were killed by a concentration that killed about 95% of the control flies that had not previously been exposed to DDT.

Descendants of these flies were tested with 10 other insecticides at the age of four days. About four times the DDT concentration was required for the resistant strain of flies as for the susceptible strain from which it was derived.

Of the 10 other insecticides tested, compounds that are chlorinated, as DDT is, were less effective than the non-chlorinated ones. Chlorinated compounds tested were: DDD, lindane, 118 or "Aldrin," toxophene and methoxychlor.

Details of the studies are reported in the journal, SCIENCE (April 13).

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CHEMISTRY

Phosphors Convert Better

➤ CHEMICAL PREPARATIONS known as phosphors, which convert invisible ultraviolet and cathode radiation to visible light, are now available in improved forms, the Electrochemical Society meeting in Washington, D. C., was told. These phosphors are important in fluorescent lamps and in television.

A new phosphor containing barium pyrophosphate and titanium dioxide was described by two British scientists, S. T. Henderson and P. W. Ranby, Thorn Electrical Industries, Limited, of London. Its luminescent properties are similar in many respects to those of magnesium tungstate, for which it is a useful substitute in fluorescent lamps. It has short afterglow, high efficiency, and good maintenance in the mercury discharge, they declared.

The important part played by arsenic in a zinc sulfide phosphor was revealed by Jerome S. Prener of the General Electric Research Laboratory, Schenectady, N. Y. The addition of small amounts of arsenic to zinc sulfide produces a phosphor which has three emission bands when excited by ultraviolet or cathode rays.

The relative intensity of the various bands depends upon the concentration of the arsenic, the atmosphere within which the phosphor is fired, the mode of excitation and the temperature during excitation. By a proper adjustment of the arsenic concentration, it is possible to produce phosphors which emit white light.

Direct excitation of phosphors by electric field was discussed by Elmer C. Payne, Eric L. Mager and Charles W. Jerome, all of Sylvania Electric Products, Inc., Salem, Mass. Electrical energy is converted directly into light by the action of a fluctuating electric field upon a suitable solid, they stated.

This solid is called a luminophor. It is embedded in a dielectric. Light output increases with the potential and frequency of the applied field, and with the dielectric constant of the dielectric. The light emitted is sufficiently intense for practical use and a number of applications have been developed. Phosphors play an important part in the sniper scopes soldiers are using in Korea to pick off enemies prowling in the dark.

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SUPER VACUUM BOTTLE—Keeping the world's coldest liquid is the job of this new vacuum bottle designed by Dr. Aaron Wexler of Westinghouse Research Laboratories. He is lifting the "bottle" from a bath of liquid nitrogen.