

## CHEMISTRY

# Single Crystals of Boron Obtained For First Time

## Mixture of Hydrogen Gas and Boron Tribromide Passed Over Tungsten or Tantalum Heated Filament in "Bulb"

THE FIRST single crystals of the little-known element boron have been produced in the laboratories of the Cornell University Department of Chemistry by Dr. A. W. Laubengayer, it was revealed in a paper read before the Sixth Annual Symposium of Physical and Inorganic Chemists at Columbus.

D. Laubengayer says, "A mixture of hydrogen gas and boron tribromide is passed over a tungsten or tantalum filament heated electrically to a very high temperature in an apparatus crudely resembling an electric light bulb. A reaction takes place at the surface of the filament, and boron is slowly deposited in the form of small single crystals. With proper care highly pure crystals may be built up."

Because boron is highly active, combining easily with other elements such as carbon and silica and with oxygen of the air, the formation of the pure crystals is a difficult operation, and special methods to eliminate chance contamination must be used. The Cornell technique is a refinement of older processes.

The research is directed toward a more exact understanding of the properties and

crystal structure of boron. As less is known today of this substance than of any of the other common elements, a more perfect knowledge of the characteristics will facilitate the synthesis of new compounds with conceivably useful properties.

The work is of both practical and scientific interest in that the atomic structure of boron predicts an element of hybrid character; and since it may be considered on the borderline between aluminum and the non-metal carbon, unusual properties not realized in other elements may be expected.

Although little is accurately known about the pure element, it is reported to have a hardness approaching that of the diamond, and is harder than the sapphire. It is believed that it will scratch carborundum. The melting point may be very high and its electrical characteristics are unique. At ordinary temperatures it is considered a poor conductor, but it increases in conductivity a million-fold when raised to 1100 degrees Fahrenheit. These properties indicate possible practical applications in electrical devices.

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analysis of how 33 concerns are using this modern resource.

Here are random items showing how research is shaping policies and efficiency:

One large retail concern had a policy of complete secrecy about its operations. Following a study of consumer attitude this firm decided it would profit by different tactics. Sales persons were trained to become sales advisers, and where technical differences were important to the shopper, arrangements were made for the customer to consult the standards section. Demonstrations widely replaced secrecy.

Some firms have studied telephone orders, to find out how accurately such sales are carried out, what the problems of returns and repeat orders are, and what the merchandising policy of the firm should be regarding telephone orders, for efficiency.

To gain actual facts, one manufacturing concern undertook to study for two years the accident and illness cases among its 7,000 employees. Results caused the firm to modify its policy about employment and retirement of older workers. It learned that older workers were less of a financial liability than had been supposed.

The report on "Business Research" which the Planning Board has transmitted to the President of the United States declares that it is of national importance that social research methods, results and problems be utilized, relating them to other forms of research, "to the end that the highest possible contribution may be made to our national resources, our national income, and to the elevation of our standards of living."

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## GENERAL SCIENCE

# Chaos in the World Makes Business Value Research

THE hard-headed American business man is going in for Research, with a capital R, it appears from the National Resources Planning Board's newest report (*Reviewed, SNL, this issue*).

Taking the stand that research is a national resource, like America's rich minerals and water power and other countable treasures, the Board has checked up on research in our business world.

Growing chaos in the world has increased dependence of business men on research, is the revelation. Study—synonym for research—grows increasingly

necessary due specifically to collapse of the foreign market, development of new products, and increased competition for consumer favors.

Some of the United States' most competent social scientists are aiding American business to use scientific methods of getting facts. Utility companies, factories, stores and other business organizations now take for granted the presence of psychologists, economists, statisticians, sociologists, and even psychiatrists on their staff rolls.

Included in the Planning Board's own research on research is a descriptive

Giving scientific tests to two flat lumps, representing roasted *buns*, found in ancient Scythian village ruins, a Soviet botanist reported that Herodotus was right when he said that the Scythians ate millet.

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