PHYSICS

New Tool for Atomic Research In Synthesized Crystals

Lithium Fluoride Which Transmits Light Over Wider Wavelength Range Than Other Substances, Now Grown

A SCIENTIFIC discovery that holds promise of contributing to important research into the atomic structure of matter became known when Prof. Donald C. Stockbarger of the Massachusetts Institute of Technology announced that he has successfully grown in his laboratory large and optically perfect lithium fluoride crystals.

Lenses made from such crystals, because they transmit light over a wider range of wavelengths than any known optical material, are expected to be a powerful new tool for science. Natural crystals of this kind are usually too small for satisfactory use in lenses, and previous attempts to grow large ones artificially have been unsuccessful until Prof. Stockbarger's research.

Formal announcement of the artificial synthesis was made by Prof. Stockbarger at the meeting of the American Physical Society in Baltimore. Several of the new crystals, including one three inches in diameter, were exhibited.

Lithium fluoride not only transmits light waves from the infra-red region through the visible part of the spectrum but farther into the ultraviolet bands than other substances.

Prime use of lithium fluoride crystals, in fact, should be in studies of the ultraviolet region of the spectrum.

In addition to its use in the ultraviolet, lithium fluoride should aid in research in the visible range, for it bends the various colors of the spectrum far more equally than other materials. Thus, images made by lenses of this substance are less subject to color fuzziness around the edges, which necessitates the use of compound lenses to offset this effect when glass or quartz lenses are used.

Crystals of lithium fluoride are also expected to aid science greatly in spectroscopic investigations, particularly in atomic research on liquids and some gases which must be confined in a container which permits the transmission of light over the widest possible range of wavelengths. Use of microscopes in various phases of research may also be widely extended by using lenses made from these crystals.

The success of Prof. Stockbarger's method of growing these crystals lies in the synthesis of lithium fluoride salt in the purest form and the growth of the crystals in a specially designed electric furnace capable of precise temperature control. In this way he expects that in the future he will be able to grow crystals even larger than three inches long.

The substance is first produced in the form of a powder and then melted in specially shaped platinum crucibles with conical bottoms. After melting, a slow process of cooling is started and a tiny seed crystal forms in the point of the crucible, growing until the entire substance is crystallized. The finished product can easily be cut to the desired size and shape and polished.

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GROWING CRYSTALS

Prof. Donald C. Stockbarger of the Massachusetts Institute of Technology has been able to grow artificial lithium fluoride crystals, a triumph of synthesis that is expected to extend greatly the horizon of atomic research. He is shown removing a three-inch crystal from the thin platinum crucible in which it was grown at a temperature of more than 1200 degrees Centigrade. Before him are other crystals he has made while the electric furnace in which they were grown is shown in the background. A peep-hole to enable him to watch the process is in the side of the furnace.

ENGINEERING

"Windbreak" of Trees May Increase Wind Velocity

SOME trees planted along a highway may fail as snow protection or windbreak and instead actually increase wind velocity at the middle of the road, Prof. Franz Aust, of the University of Wisconsin, told the Highway Research Board.

Tests were made by Prof. Aust of the effectiveness as wind barriers of five kinds of trees—white pine, willow, Norway spruce, hard maple, and evergreen snow fence. It was the hard maples that would under certain conditions increase the wind in the road.

The greatest reductions in wind velocity for the various trees varied from 52 per cent. to 97 per cent. of the wind speed where there was no barrier.

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