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The Dielectric Properties of Some Crystals at Radio Frequencies

A. A. Aardal

EFFECTS OF IRRADIATED OILS ON PHOTOGRAPHIC FILMS

JAY W. WOODROW AND A. C. BAILEY

(ABSTRACT)

During the past two years, there has been considerable discussion on the question of the emission of ultra-violet light by cod-liver oil. Our experiments have confirmed the opinion that no radiations are emitted which can penetrate plates of fused quartz one millimeter in thickness. However, an image is produced on a photographic film placed directly above the oil, an effect which is attributed to a direct chemical action.

We have also found that other oils which would not produce images on the photographic film can be activated by ultra-violet light so that they act like cod-liver oil. Different oils can be activated in different degrees, which is similar to the results obtained with the production of antirachitic properties in them by ultra-violet light.

IOWA STATE COLLEGE,
AMES, IOWA.

THE DIELECTRIC PROPERTIES OF SOME CRYSTALS AT RADIO FREQUENCIES

A. A. AARDAL

(ABSTRACT)

An attempt has been made to study the dielectric properties of a few crystals at radio frequencies ranging between 50 and 3000 kilo-cycles per second.

The properties studied are phase difference, dielectric constant, capacity, resistance, and power factor.

It is found that the dielectric constant, the electrical capacity and resistance decreases with the increase in frequencies of electrical oscillation, and that the phase difference and power factor increase with increase in frequencies.

Some of the crystals used as specimen are: Rock Salt, Gypsum, Strontium Sulphate and Calcium Carbonate, etc. A further study was contemplated to connect up the crystal structure with these dielectric properties, but so far nothing definite can be stated as to whether these properties have anything to do with the struc-

ture of the crystal. A greater number of crystals must be examined and compared.

The experimental method used is one described in Scientific Papers No. 471, U. S. Bureau of Standards, and consists essentially of an oscillator capable of various frequencies and a measuring circuit coupled to the oscillating circuit. The capacity as well as the resistance of the specimen is thus measured when the two circuits are in resonance with each other.

THERMOELECTRIC EFFECT IN SINGLE CRYSTAL ZINC WIRES

E. G. Linder

(ABSTRACT)

The work reported is a continuation of measurements published in the Physical Review for October, 1925. The thermol e.m.f. of the zinc crystals against copper has been measured from -182°C to 480°C for crystals having orientations from about 10° to 90°. The relation between thermoelectric power and temperature is definitely not linear, but may be represented fairly well by a second degree equation.

The nature of the effect in the neighborhood of the melting point will be discussed.

State University of Iowa,
Iowa City, Iowa.

NOTE ON THE REVERSAL OF THE SODIUM LINE

L. B. Spinney

(ABSTRACT)

The reversal of the sodium line may be demonstrated without the use of a slit or a spectroscope. An incandescent lamp having either a carbon or tungsten filament is placed immediately behind a good sodium flame and viewed from a distance of fifteen or twenty inches through a diffraction grating. The first- and second-order spectra, right and left, will both be in view and in the orange-yellow region of each will appear a sharp dark-line image of the filament of the lamp. This image constitutes the dark-line spectrum of the sodium vapor.

A Meker burner on which a few crystals of fused salt have been