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Magnetic Properties of Thin Films of Iron, Electrolytically Deposited

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From these facts I conclude that students grades in physics highly correlate with grades in other subjects and hence physics would seem to present no greater difficulties to the student than those encountered in his other subjects.

DRAKE UNIVERSITY,
DES MOINES, IOWA.

OPTICAL CONSTANTS OF BISMUTH CRYSTALS IN
THE ULTRA-VIOLET

FLORENCE E. DIX

(*ABSTRACT*)

Index of refraction and extinction index for light reflected from a cleavage surface of a bismuth crystal have been determined at several wavelengths in the ultra-violet. The crystelliptometer of Weld is being used. A comparison in the overlapping region with the measurements of Rowse will be given.

STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.

MAGNETIC PROPERTIES OF THIN FILMS OF IRON,
ELECTROLYTICALLY DEPOSITED

E. P. T. TYNDALL

(*ABSTRACT*)

Films of iron from 100 to 200 millimicrons thick deposited electrolytically from neutral and acid solutions of iron ammonium sulphate show a surprising magnetic hardness. At a field of 40 gauss the intensity of magnetization is from 200 to 300 c.g.s. units. No sudden increase in magnetization is found up to fields of 150 gauss. Films deposited on the initial film, using much smaller current densities than that required for the initial deposit, show the usual properties of electrolytic iron. An intensity of magnetization of 1000 is reached at 40 gauss field. The cause of the hardness of the initial films is not apparent. The great thickness at which it occurs in comparison with Maurain's critical thickness renders unlikely the assumption of a pure "thinness" effect. It may be due to the occluded hydrogen, though it does not seem likely that much hydrogen is occluded since (1) a heat treatment in carbon dioxide of several hours at 250°C changes

the magnetic properties not at all, (2) the films are permanent in time in magnetic properties and do not rust.

STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.

POTENTIALS OF SPARK LINES OF MERCURY VAPOR

J. A. ELDRIDGE

(*ABSTRACT*)

It has been shown by a series of photometric readings on thirty spark lines of mercury falling in the range 2000-5000 angstroms, that these lines fall into three groups. (1) Excitation potential at about 20 volts, (2) excitation potential about 28 volts and (3) excitation potential about 55 volts. The exact values of these potentials are uncertain since they depend upon pressure and current conditions. If we accept the results of Smythe that double ionization occurs first at 20 volts and triple ionization certainly not under 100 volts we may suppose the first class of lines as due to the removal of the second valence electron. The other lines are not so easily explained but are probably due to electrons displaced from the inner levels.

STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.

THE ABSORPTION OF MOISTURE BY HARD RUBBER

GEO. E. THOMPSON

(*ABSTRACT*)

A study is being made of the effects of relative humidity and electric fields on moisture absorption by hard rubber.

A specimen of hard rubber is suspended in a constant temperature box from the beam of a sensitive chainomatic balance. The relative humidity of the box is varied by placing sulphuric acid of various concentrations in the box. The rubber specimen is suspended between two brass electrodes which are attached to a 10,000 volt transformer.

At 100 per cent humidity the effect of the electric field is to increase the rate of moisture absorption at first and later to diminish it. At 70 per cent humidity the electric field seemed to be without effect.