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## Adiabatic Compressibility of Electrolytic Solutions and the X-Ray Diffraction Intensity Distributions

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## REPORTS

### THE RECIPROCAL BENDING - TORSION EFFECT FOR LEAD SINGLE CRYSTALS

STANLEY BRUNTJIN

A single crystal rod subjected to a pure axial torque also bends. Direct measurements on this effect have been made for lead single crystals.

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### ADIABATIC COMPRESSIBILITIES OF SOME AQUEOUS SOLUTIONS AND THEIR VARIATION WITH THE IN- DICATED LIQUID STRUCTURE OF THE WATER

VICTOR B. COREY

Adiabatic compressibilities of aqueous solutions of twenty-seven strong electrolytes were determined by measuring the velocities of a supersonic wave of approximately  $10^6$  cycles. When the values of the partial molal volumes of the solute, water, were computed, there was found a striking correlation of these values with the adiabatic compressibilities. An exact correlation cannot be expected both because of the empirical nature of the formulas used and also because there is no reason to suppose that the altered structure of the water is of the same kind in every electrolyte. The results, however, are strongly indicative of the view that ions alter the structure of the solute, the water becoming more dense with ionic concentration.

STATE UNIVERSITY OF IOWA,  
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### ADIABATIC COMPRESSIBILITY OF ELECTROLYTIC SOLUTIONS AND THE X-RAY DIFFRACTION INTENSITY DISTRIBUTIONS

V. B. COREY AND G. W. STEWART

A study of the adiabatic compressibility and the X-ray diffraction intensity distributions of twenty-six strong electrolytes shows a correlation to the following extent. If one compares the rate of change of adiabatic compressibility per mole with the rate of change of the minor X-ray diffraction peak per mole in two thirds

of the twenty-six samples these values increase in magnitude together. If one plots the values of the former, changing from one to eight times, and of the latter varying sixty times, the points are included within an angle of about  $35^\circ$  (with one exception). This approximate correspondence adds credence to the view—obtained on other grounds, that the water structure alters by the breaking of H bonds and that this is the chief cause of the variations in the adiabatic compressibility.

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## A SIMPLIFIED CONDUCTIVITY-RADIATION EXPERIMENT FOR THE ELEMENTARY LABORATORY

LESTER T. EARLS

In an attempt to fill a need for the laboratory approach to the physical processes of conduction and radiation of heat, the following two-part experiment is suggested:

The heat conductivity of a poorly conducting specimen (such as wool cloth) is measured by allowing heat to flow through it from a hot cup above into a copper receiving block below. Direct measurements permit the calculation of the coefficient of thermal conductivity with an accuracy which is adequate for the elementary laboratory work. The heat-absorbing characteristics of various surfaces are tested by using them to face copper blocks of similar dimensions, and radiating them with the heat and light radiations from either a cone-type radiant electric heater or a 200-watt electric light.

Typical data taken by elementary physics students in a three-hour laboratory period are presented and discussed.

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## CONCERNING PHYSICS APTITUDES

C. J. LAPP

The search for physics aptitudes extends back to 1926 when eight were tentatively listed. The checking and rechecking of these have resulted in discarding of six. Of the many new aptitudes suggested and studied, four new ones have been discovered. The