

the dipole rotation is a limited rotation of the entire molecule or merely of the hydroxyl group.

FRICK CHEMICAL LABORATORY
PRINCETON UNIVERSITY
PRINCETON, NEW JERSEY

C. S. HITCHCOCK
C. P. SMYTH

RECEIVED FEBRUARY 8, 1933 PUBLISHED MARCH 7, 1933

THE ACTION OF BROMINE AND BUTADIENE

Sir:

Dr. H. Eyring has presented calculations in a paper given before the Section of Chemistry of the American Association for the Advancement of Science which indicated that addition of bromine to butadiene should be 1-4 rather than 1-2. The high energy of activation also indicated that the reaction should not occur in the gas phase. At the request of Doctors Taylor and Eyring, experiments have been made which show that on mixing gaseous butadiene and bromine in the ratio of 1-1 or 1-0.5 with from 15-20 volumes of nitrogen a reaction occurs and that crystals of the 1,4-dibromo-2-butene are formed. The melting point of the unpurified crystals was 53° (very sharp), which is identical with that reported in the literature. A mixture of the product with 1,2,3,4-tetrabromobutane melted from 30 to 48°. On carrying out the reaction in the same bulb which had been previously coated with paraffin, the rate of the reaction was very markedly reduced. This fact together with the observation that no fog or smoke formed in the uncoated reaction sphere leads to the conclusion that the reaction occurs on the surface. The kinetics of the reaction on glass and surfaces are being studied and details of the experiments will be reported later.

SCHOOL OF CHEMISTRY
UNIVERSITY OF MINNESOTA
MINNEAPOLIS, MINNESOTA

G. B. HEISIG

RECEIVED FEBRUARY 20, 1933 PUBLISHED MARCH 7, 1933

THE ISOTOPE OF HYDROGEN

Sir:

With the aid of Dr. R. T. Macdonald I have been attempting to isolate various isotopes. Less than a month ago we turned our attention to the isotope of hydrogen. Our first experiments, employing a difference in overvoltage suggested by the work of Washburn and Urey, were so promising that we at once planned a systematic series of concentrations which has just been completed. This yielded water of specific gravity 1.035, which means that the heavy isotope constitutes one-third of all the water

present. The refractive index of this heavy water is considerably lower than that of ordinary water, but exact figures cannot be given until the concentration has been accurately determined.

The separation of any isotope in sufficient quantity to permit investigation not only of its spectroscopic but also of its other chemical and physical properties suggests a wide range of interesting experiments but the isotope of hydrogen is, beyond all others, interesting to chemists. I believe that it will be so different from common hydrogen that it will be regarded almost as a new element. If this is true the organic chemistry of compounds containing the heavy isotope of hydrogen will be a fascinating study.

DEPARTMENT OF CHEMISTRY
UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

GILBERT N. LEWIS

RECEIVED FEBRUARY 23, 1933 PUBLISHED MARCH 7, 1933

NEW BOOKS

Life and Experiences of a Bengali Chemist. By PRAFULLA CHANDRA RAY. Chucker-
vertty, Chatterjee and Co., Ltd., 15 College Square, Calcutta, India, 1932. x +
557 pp. 14 × 22.5 cm.

This is an interesting and inspiring account of what a chemist's life can be. The first half of the book (Part I) is explicitly autobiographical. It describes in nearly chronological order: the author's early years on his father's estate in Bengal and at school in Calcutta; his student days under Crum Brown at Edinburgh; his return to become a professor of chemistry at Presidency College at Calcutta; his life as a teacher; his establishment during his spare time of the Bengal Chemical and Pharmaceutical Works, Ltd., now one of the great industrial concerns of India; his studies in the history of Hindu chemistry; his extensive experimental researches; finally, his manifold and multifarious activities in the public service.

The second half of the book (Part II) is only autobiographical; it contains numerous essays on educational, industrial, economic and social subjects. They not only serve to define the author's personality and point of view but they are also of the greatest interest, particularly to a far-away American, for the light they throw on the problems of present-day India. The author attacks scathingly the caste system that hangs as a millstone about India's neck and the ignorance and superstition of many of the Hindus. But his fiercest invective is launched against the spiritlessness and supineness of his fellow Bengali. As regards the British-Indian government he reaches, although by a different route and disagreeing with him in many vital points, the same position of non-coöperation championed by his compatriot Gandhi.

To the readers of this autobiography it is clear that, while Sir P. C. Ray has been a great scholar, chemist, teacher and administrator, these activities have been to him of secondary importance; he has been first, last and all the time a patriot—a Hindu and a Bengali. And he dedicates this account of his life, his opinions and his hopes for his country "To the Youth of India."

ARTHUR B. LAMB