The Octanes

BY FRANK C. WHITMORE AND K. C. LAUGHLIN

It is of interest to note that all eighteen of the structurally isomeric octanes have now been synthesized. This was accomplished when the three remaining trimethylpentanes were prepared by us [THIS JOURNAL, **55,** 2608 (1933)], although we were not aware at the time that we had completed the octane series. The preparation of the other isomers may be found as follows: Tafel and Jürgens, *Ber.*, **42,** 2548 (1909); Richard, *Ann. chim. phys.*, (8) **21,** 323 (1910); Noller, THIS JOURNAL, **51,** 594 (1929); Edgar and Calingaert, *ibid.*, **51,** 1546 (1929); Whitmore, Stehman and Herndon, *ibid.*, **55,** 3807 (1933); Parks and Huffman, *Ind. Eng. Chem.*, **23,** 1138 (1931); de Graef, *Bull. soc. chim. Belg.*, **40,** 315 (1931). Optical isomers of 3-methylheptane and 2,4-dimethylhexane have also been prepared [Levene and Marker, *J. Biol. Chem.*, **91,** 405, 761 (1931)].

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COMMUNICATIONS TO THE EDITOR

THE MUTAROTATION OF α-*d*-GLUCOSE IN HEAVY WATER

Sir:

It is generally accepted today that mutarotation in reducing sugars and sugar derivatives of various types depends on the presence of a displaceable hydrogen atom. A rearrangement of bonds consequent upon the displacement of this particular hydrogen atom, as in the keto-enolic isomeric changes, causes the reversible conversion of an oxide sugar into the intermediate aldehyde. Hudson [*Z. physik. Chem.*, **44,** 487 (1903)] has shown that the equal velocities of mutarotation of the α- and β-forms of sugars are due to opposite parts of one balanced reaction, and [Hudson and Dale, THIS JOURNAL, **39,** 320 (1917)] that the velocity coefficients for α- and β-glucose, determined at eight temperatures from 0.7 to 40°, are identical. Since the mutarotation of the sugars is evidently due to the wandering of a mobile hydrogen atom, it was thought interesting to investigate the effect produced by the wandering of a heavy hydrogen atom in a sugar molecule. The following experiment was carried out at 18°. A sample of 1.0024 g. of α-*d*-glucose was dissolved in 5 cc. of distilled water, and the change of the rotation was measured in a 2-dm. semi-micro tube with sodium light. The first reading was taken six minutes after the addition of water. The velocity-coefficient was found to be $k_1 + k_2 =$