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UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
Washington

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POLARIMETRY AND ITS APPLICATION TO THE SUGARS AND THEIR DERIVATIVES

Publications by the Staff of the National Bureau of Standards

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Contents

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Transactions of the Society of Glass Technology,
Sheffield, England.

Zeitschrift des Verein der Deutschen Zucker-Industrie,
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II. POLARIMETRIC MEASUREMENTS

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Spectrum lines as light sources in polariscopic measurements. Frederick Bates. Bul. BS 2, 239 (1906)	S34	OP
A quartz compensating polariscope with adjustable sensibility. Frederick Bates. Bul. BS 4, 461 (1908). Also in Z. Ver. Deut. Zuckerind. 58, 105 (1908); International Sugar J. 9, 588 (1907); Am. Sugar Ind. 13, 254 (1911)	S86	OP
Remarks on the quartz compensating polariscope with adjustable sensibility. Frederick Bates. Bul. BS 5, 193 (1908)	S98	5¢
Constants of the quartz-wedge saccharimeter and the specific rotation of sucrose. 1. The constants for the 26-gram normal weight. Frederick Bates and Richard F. Jackson. Bul. BS 13, 67 (1916). Also in Z. Ver. Deut. Zuckerind. 67, 347 (1917); Sugar 18, pp. 242, 305, 365, 419 (1916); Sugar (Spanish section) 18, pp. 279, 343, 456, 507, 552 (1916); Record of Hawaiian Chemists Assn. (1917); J. Wash. Acad. Sci. 6, 25 (1916)	S268	15¢
Polarimetry. Cir. BS 44 (2nd edition, 1918). Superseded by Circular C440. (For first edition, see Circ. BS 12 (1906)	C44	OP
Report of committee on quartz plate standardization and normal weight. Frederick Bates, C.A. Browne, and F.W. Zerban. J. Assn. Official Agri. Chem. 16, 39 (1933).	--	--
Polarimetry, Saccharimetry and the Sugars. Frederick Bates and Associates. Circular NBS C440 (1942) (810 pages)	C440	$2.00

III. PREPARATION, STRUCTURE, AND OPTICAL ROTATION OF:

(a) SUCROSE

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The influence of basic lead acetate on the optical rotation of sucrose in water solution. Frederick Bates and J.C. Blake. Bul. BS 3, 105 (1907). Also in J. Am. Chem. Soc. 29, 286 (1907)	S52	OP
The crystallography of sucrose. Francis P. Phelps. Proc. Fourth Congress of International Soc. Sugar Cane Tech., Bul. 104, San Juan, P.R. (1932)	--	--

(b) DEXTROSE

The saccharimetric normal weight and specific rotation of dextrose. Richard F. Jackson. Bul. BS 13, 633 (1916)	S293	10¢
The solubility of dextrose in water. Richard F. Jackson and Clara Gillis Silsbee. Sci. Pap. BS 17, 715 (1922)	S437	5¢
Research work at the Bureau of Standards on the establishing of dextrose and levulose industries. Frederick Bates. Facts About Sugar 21, 250 (1926); Planter and Sugar Manuf. 76, 228 (1926); Sugar 28, 167 (1926); Z. Ver. Deut. Zuckerind. 76, 316 (1926); International Sugar J. 28, 330 (1926)	--	--
Sugar standards researches. Levulose and dextrose. Frederick Bates. The United States Daily (Washington, D.C.), April 9 and 10, 1928	--	--
The National Bureau of Standards and the establishment of hard refined dextrose and levulose industries. Frederick Bates. National Bureau of Standards Letter Circular 500	LC500	--

(c) LEVULOSE

A method for the manufacture of levulose. R.F. Jackson, C.G. Silsbee, and M.J. Proffitt. Ind. Eng. Chem. 16, 1250 (1924); Facts About Sugar 19, 586 (1924); Sugar 27, 9 (1925); Planter and Sugar Manuf. 73, 469 (1924)	--	--

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The preparation of levulose. Richard F. Jackson, Clara Gillis Silsbee, and Max J. Proffitt. Sci. Pap. BS 20, 587 (1926). Also in Planter and Sugar Manuf. 76, pp. 230, 248, 268, 289 (1926); Facts About Sugar 21, 326 (1926), a review; Sugar 28, pp. 170, 222, 326, 380 (1926); J. Fabricants de Sucre, May 15, 1926 (translation of above review from Facts About Sugar)	S519	10¢
Research work at the Bureau of Standards on the establishing of dextrose and levulose industries. Frederick Bates. Facts About Sugar 21, 250 (1926); Planter and Sugar Manuf. 76, 228 (1926); Sugar 28, 167 (1926); Z. Ver. Deut. Zuckerind. 76, 316 (1926); International Sugar J. 28, 330 (1926)	--	--
Sugar standards researches. Levulose and dextrose. Frederick Bates. The United States Daily (Washington, D.C.), April 9 and 10, 1928.	--	--
The National Bureau of Standards and the establishment of hard refined dextrose and levulose industries. Frederick Bates. Letter Circular NBS 500 (1937)	LC500	--
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Structure of difructose anhydride III (difructofuranose 1,2', 2,3'-anhydride). Emma J. McDonald and Richard F. Jackson. J. Research NBS 24, 181 (1940).....	RP1277	10¢

(d) OTHER SUGARS

Preparation of galactose. E.P. Clark. Sci. Pap. BS 17, 227 (1921). Also in J. Biol. Chem. 47, 1 (1921).....	S416	OP
Note on the preparation of mannose. E.P. Clark. Sci. Pap. BS 17, 567 (1922). Also in J. Biol. Chem. 51, 1 (1922).....	S429	OP
An improved method for preparing raffinose. E.P. Clark. Sci. Pap. BS 17, 607 (1922). Also in J. Am. Chem. Soc. 44, 210 (1922).....	S432	OP
The structure of fucose. E.P. Clark. Sci. Pap. BS 18, 527 (1922). Also in J. Biol. Chem. 54, 65 (1922).....	S459	OP

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Relations between rotatory power and structure in the sugar group. XV. Conversion of lactose to another disaccharide, neolactose. The chloro-hepta-acetate and two octa-acetates of neolactose. Alfons Kunz and C.S. Hudson. J. Am. Chem. Soc. 48, 1978 (1926)	--	--
Relations between rotatory power and structure in the sugar group. XVI. Conversion of cellobiose to another disaccharide, celtrobiose, by the aluminum chloride reaction. Chloro-acetyl celtrobiose. C.S. Hudson. J. Am. Chem. Soc. 48, 2002 (1926)	--	--
Relations between rotatory power and structure in the sugar group. XVII. The structure of neolactose. Alfons Kunz and C.S. Hudson. J. Am. Chem. Soc. 48, 2435 (1926)	--	--
The occurrence of gentiobiose in the products of the commercial hydrolysis of corn starch. Henry Berlin. J. Am. Chem. Soc. 48, 2627 (1926)	--	--
Two isomeric crystalline compounds of d-mannose with calcium chloride. J.K. Dale. BS J. Research 3, 459 (1929). Also in J. Am. Chem. Soc. 51, 2788 (1929)	RP106	5¢
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Relations between rotatory power and structure in the sugar group. XXVII. Synthesis of a new disaccharide ketose (lactulose) from lactose. Edna M. Montgomery and C.S. Hudson. J. Am. Chem. Soc. 52, 2101 (1930)	--	--

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Relations between rotatory power and structure in the sugar group. XXVIII. The conversion of d-alpha-glucoheptose to a new ketose, d-glucoheptulose. W.C. Austin. J. Am. Chem. Soc. 52, 2106 (1930)	--	--
A note on the purification of α-d-xylose and its mutarotation. Horace S. Isbell. J. Research NBS 13, 515 (1934)	RP723	5¢
A convenient modification of the Kiliani synthesis of higher carbon acids (or their lactones) from reducing sugars. (Note) C.S. Hudson, Olive Hartley, and Clifford B. Purves. J. Am. Chem. Soc. 56, 1248 (1934)	--	--
Preparation of crystalline β-d-allose. (Communication to the Editor) Francis P. Phelps and Frederick Bates. J. Am. Chem. Soc. 56, 1250 (1934).	--	--
Crystalline β-glucoheptose and its mutarotation. (Communication to the Editor) Horace S. Isbell. J. Am. Chem. Soc. 56, 2789 (1934)	--	--
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Action of baker's yeast on d-talose. Horace S. Isbell. J. Research NBS 22, 403 (1939)	RP1191	5¢
Hydrolysis of turanose in alkaline solution. Horace S. Isbell. J. Research NBS 26, 35 (1941)	RP1356	5¢
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(e) SUGAR DERIVATIVES

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Relations between rotatory power and structure in the sugar group. I. The halogen-acyl and nitro-acyl derivatives of the aldose sugars. C.S. Hudson. J. Am. Chem. Soc. 46, 462 (1924)	--	--
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Relations between rotatory power and structure in the sugar group. VIII. Some terpene alcohol glycosides of glucose, glucuronic acid, maltose, and lactose. C.S. Hudson. J. Am. Chem. Soc. 47, 537 (1925)	--	--
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Studies on salicin. I. Exceptional rotations of the halogeno-tetra-acetyl derivatives of salicin. A new synthesis of salicin. Alfons Kunz. J. Am. Chem. Soc. 48, 262 (1926)	--	--

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Relations between rotatory power and structure in the sugar group. XII. The preparation and properties of pure alpha-methyl d-lyxoside. F.P. Phelps and C.S. Hudson. J. Am. Chem. Soc. 48, 503 (1926)	--	--
Relations between rotatory power and structure in the sugar group. XIII. A classification of various substances of the mannose and rhamnose series according to ring types. C.S. Hudson. J. Am. Chem. Soc. 48, 1424 (1926)	--	--
Relations between rotatory power and structure in the sugar group. XIV. The determination of ring structures in the glucose, mannose and rhamnose series. C.S. Hudson. J. Am. Chem. Soc. 48, 1434 (1926)	--	--
Relations between rotatory power and structure in the sugar group. XVIII. Alpha-methyl d-lyxoside triacetate. F.P. Phelps and C.S. Hudson. J. Am. Chem. Soc. 50, 2049 (1928)	--	--
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The structures of the acetylmethylmannosides. (Communication to the Editor) H.S. Isbell. J. Am. Chem. Soc. 52, 5298 (1930).....	--	--
Application of the fluorating process to fructose. D.H. Brauns and Harriet L. Frush. BS J. Research 6, 449 (1931).....	RP287	5¢
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β-d-Talose and d-talose acetates and orthoesters. William Ward Pigman and Horace S. Isbell. J. Research NBS 19, 189 (1937).....	RP1021	5¢
Preparation and properties of β-d-2-desoxygalactose. Horace S. Isbell and William W. Pigman. J. Research NBS 22, 397 (1939).....	RP1190	5¢

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Alpha and beta methyl lyxosides, mannosides, gulosides, and heptosides of like configuration. Horace S. Isbell and Harriet L. Frush. J. Research NBS 24, 125 (1940).....	RP1274	10¢
Chemistry of the carbohydrates and glycosides. Horace S. Isbell. Annual Review Biochem. 9, 65 (1940).....	--	--
Chemistry of the carbohydrates. Horace S. Isbell. Annual Review Biochem. 12, 205 (1943)	--	--
Sugar acetates, acetylglycosyl halides, and orthoacetates in relation to the Walden inversion. Harriet L. Frush and Horace S. Isbell. J. Research NBS 27, 413 (1941).....	RP1429	10¢

IV. OXIDATION OF SUGARS AND OXIDATION PRODUCTS

Improvements in the preparation of aldonic acids. C.S. Hudson and H.S. Isbell. BS J. Research 3, 57 (1929). Also in J. Am. Chem. Soc. 51, 2225 (1929).....	RP82	5¢
The oxidation of sugars. I. The electrolytic oxidation of aldose sugars in the presence of a bromide and calcium carbonate. Horace S. Isbell and Harriet L. Frush. BS J. Research 6, 1145 (1931).....	RP328	5¢
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Manufacture of calcium gluconate by the electrolytic oxidation of dextrose. Horace S. Isbell, Harriet L. Frush, and F.J. Bates. BS J. Research 8, 571 (1932). Also in Ind. Eng. Chem. (Analytical Ed.) 24, 375 (1932)...	RP436	5¢
A study of the delta lactones formed by the oxidation of aldoses with bromine water. Horace S. Isbell. BS J. Research 8, 615 (1932).....	RP441	5¢
Oxidation of the alpha and beta forms of the sugars. (Communication to the Editor) Horace S. Isbell. J. Am. Chem. Soc. 54, 1692 (1932).....	--	--

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Preparation and properties of aldonic acids and their lactones and basic calcium salts. Horace S. Isbell and Harriet L. Frush. BS J. Research 11, 649 (1933)	RP613	5¢
Preparation of calcium lactobionate and lactobionic delta-lactone. Horace S. Isbell. BS J. Research 11, 713 (1933)	RP618	5¢
Optical rotations and other properties of the lead and calcium aldonates. Horace S. Isbell. J. Research NBS 14, 305 (1935)	RP770	5¢
Electrolytic oxidation of xylose in the presence of alkaline earth bromides and carbonates. Horace S. Isbell and Harriet L. Frush. J. Research NBS 14, 359 (1935)	RP773	5¢
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Chemical reactions of the chlorites with carbohydrates. Allene Jeanes and Horace S. Isbell. J. Research NBS 27, 125 (1941)	RP1408	10¢
Use of chlorites for treating raw sugars. Horace S. Isbell. J. Research NBS 27, 491 (1941)	RP1436	5¢
Application of the dropping-mercury electrode to the investigation of the polyhydroxy acids and lactones. Harry Matheson, Horace S. Isbell, and Edgar Reynolds Smith. J. Research NBS 28, 95 (1942)	RP1448	10¢
Preparation of lower aldonic acids by oxidation of sugars in alkaline solution. Horace S. Isbell. J. Research NBS 29, 227 (1942)	RP1497	5¢

V. MUTAROTATION AND COMPARISONS OF OPTICAL ROTATION

Optical rotation and ring structure in the sugar group. The optical rotation of the various asymmetric carbon atoms in the hexose and pentose sugars. H.S. Isbell. BS J. Research 3, 1041 (1929)	RP128	5¢

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Optical rotation and atomic dimension - Halogeno-tetra-acetyl derivatives of mannose. Their configurational peculiarities. D.H. Brauns. BS J. Research 7, 573 (1931). Also as a Communication to the Editor. J. Am. Chem. Soc. 53, 2004 (1931)	RP358	10¢
The oxidation of alpha and beta glucose and a study of the isomeric forms of the sugar in solutions. Horace S. Isbell and Ward Pigman. BS J. Research 10, 337 (1933)	RP534	5¢
The calcium chloride modifications of mannose and gulose. (Communication to the Editor) H.S. Isbell. J. Am. Chem. Soc. 55, 2166 (1933)	--	--
Mutarotation of β-d-ribose and β-l-ribose. (Communication to the Editor) Francis P. Phelps, Horace S. Isbell, and Ward Pigman. J. Am. Chem. Soc. 56, 747 (1934)	--	--
Optical rotation and atomic dimension. (Communication to the Editor) D.H. Brauns. J. Am. Chem. Soc. 56, 1421 (1934)	--	--
Nomenclature of the alpha and beta sugars. (Note) Horace S. Isbell. J. Chem. Education 12, 96 (1935)	--	--
Note on the thermal mutarotation of d-galactose, l-arabinose, and d-talose. Horace S. Isbell and W.W. Pigman. J. Research NBS 16, 553 (1936)	RP892	5¢
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