AMERICAN GLUCOSE CO.

41° Bé. Mixing Glucose,		0.0184	0.016	0.019	0.014		SO_2
42° " Crystal Glucose,		0.0184	0.0165	0.0205	0.0205		"
43° " Confectioners' Glucose,		0.0184	0.0184	0.0190	0.0184	0.020	"
42° " Brewers' Jelly,		0.0164	0.0164	0.0142	0.0123		"
44° " Export,		0.0172	0.021	0.023			"
42° " Acid Glucose,		0.050	0.048	0.052	0.064	0.0505	"
45° " Export,		0.0225	0.0201				"
"70" Sugar,	0.036	0.032	0.0279	0.021	0.019		HCl.
	0.016	0.018	0.017	0.027	0.028		"
	0.0295	0.0286	0.032	0.040	0.040		"
	0.045	0.0408	0.043				"

WAVERLY FARM, TOPEKA, KAN.,
February 14, 1895.

ASH IN GLUCOSE SYRUP AND GRAPE-SUGAR.

BY H. E. HORTON.

Received February 18, 1895.

OF the quantity of ash in glucose syrup and grape-sugar now offered in open market, little is published. Wishing to throw some light on this subject I present figures obtained on analysis of a number of American brands.

The ash determinations were made as follows: Five to ten grams of syrup or sugar weighed in a platinum dish of about 100 cc. capacity, heated with great care until water is expelled, slowly carbonized, and then heated in a muffle at low redness to a finish.

Hydrated grape-sugar, so-called "70" sugar, manufactured by the American Glucose Co.:

Per cent.
0.536 0.540 0.510 0.510 0.530 0.67 0.31 0.22
0.536 0.540

Samples of "Special Coloring," American Glucose Co.:

Per cent.		Per cent.
0.31	to	0.52

Samples of "Climax" or "Acme" sugars, manufactured by American Glucose Co.:

"Special dark."	"Dark."	"Light."
0.205	0.16	0.15

"Brewers' sugar," manufactured by Chicago Sugar Refining Co.:

"White." Per cent.	"Standard." Per cent.	"Special dark." Per cent.
0.74	1.00	0.51
0.73	0.72	0.74
	1.15	0.43

"Brewers extract," Chicago Sugar Refining Co., 0.46 per cent.

American Glucose Co., glucose syrups:

	Per cent.		
43° Bé. confectioners' glucose,	0.81	0.33	0.74
41 " mixing glucose.	0.24	0.24	0.26

Chicago Sugar Refining Co.:

	Per cent.		
41° Bé. glucose,	0.14	0.12	0.13
43° " "	1.10	0.65	

National Starch Manufacturing Co., Glen Cove Factory., confectioners' glucose:

Per cent.		
0.80	0.77	0.46

Chas. Pope Glucose., confectioners' glucose, 0.84 per cent.

Peoria Grape-Sugar Works:

41° Bé. glucose, 0.26 0.28 0.26

The composition of the ash varies with the process of manufacture. If the starch be inverted with muriatic acid and neutralized with sodium carbonate and hydroxide, the ash in finished product will sometimes run over one per cent. and consist almost entirely of sodium chloride.

When oxalic acid is used for inverting and calcium carbonate for neutralizing, calcium oxalate, which is sparingly soluble in glucose solutions, will be found present in glucose, and go over into carbonate on ashing.

When calcium sulphate is used for "brightening" the glucose, a large quantity of it will be present in the ash.

The ash of oxalic acid glucose will contain a small amount of chlorides, coming from muriatic acid used for "souring" the bone, from muriatic added with bisulphite to finished goods in cooler, from sodium chloride by decomposition of calcium chloride with sodium sulphate after neutralizing, and also from the calcium chloride when the liquor does not receive sufficient sodium sulphate for complete decomposition

When special prepared phosphate bone is used in the manufacture of syrup and sugar, phosphates are found in the ash. I have found as high as nineteen per cent. of phosphorus pentoxide present.

Iron is present in every ash. It is introduced into the process at the outset and is taken out and as often replaced up to the finish. Batches of glucose made from thin liquor first boiled in a vacuum pan after boiling out with muriatic acid, contain an abnormal amount of iron.

WAVERLY FARM, TOPEKA, KAN.,
January 20, 1895.

THE ZIMMERMANN-REINHARDT METHOD FOR THE DETERMINATION OF IRON IN IRON ORES.[1]

BY C. T. MIXER AND H. W. DUBOIS.

Received March 6, 1895.

THE methods chiefly employed in this country for the determination of iron in ores, are the permanganate and Kessler's modification of the old bichromate method (Penny's).

Recently a method has been proposed by R. W. Mahon in the *American Chemical Journal*, **15**, 360. The chief feature of this method consists in the proposed use of an indicator solution, for titration with stannous chloride. The indicator solution consists of platinic and mercuric chlorides, the end reaction being indicated by the darkening of the mercurous chloride (formed by the slight excess of stannous chloride), which is caused by the formation of mercurous platinochloride.

As regards this method, it would seem that the frequent standardizations of the stannous chloride that must be made, is a serious objection, and further, the indicator which is used, cannot compare in distinctness with that produced by potassium permanganate.

The objections to the first two methods are mainly those of time consumed in their operation, which specially concerns those who have to make large numbers of determinations. Their general accuracy can hardly be questioned.

[1] This article includes the modifications of the method, as practiced in the Lake Superior iron region.