used primarily as an oxidizing or a reducing agent and only secondarily as an agent for electrolytic decompositions.

There is one great desideratum, and that is a cheap insoluble anode. Platinum is too expensive, and carbon will not long withstand oxidation. It is this lack which to-day, among other conditions, prevents electricity from being a rival to the ammonia process of making soda and to the Leblanc process for producing bleaching powder as a by-product, and to its utilization as an oxidizing agent. When the cheap insoluble anode is found it will open a wide door to the applications of electricity to the chemical arts.

[CONTRIBUTIONS FROM THE ANALYTICAL LABORATORIES OF THE SCHOOL OF MINES, COLUMBIA COLLEGE.—NO. 1.]

THE IODINE FIGURE OF ROSIN.

BY PARKER C. MCILHINEY, PH.B., A.M.

Received December 9, 1893.

IN the analyses of oils, and especially drying oils, one of the most useful tests is a determination of the Hübl number. The iodine figure of rosin, which is a common adulterant of oils, is stated by Benedikt (Analyse der Fette und Wachsarten, 171) to be 115.7; Williams (*Chem. News*, **58,** 224) gives 115.31 and 114.80 for refined rosin and 112.01 and 113.28 for ordinary. Mills (Destructive Distillation, 13) has determined the bromine absorption to be 112.7 per cent., which would correspond to an iodine absorption of about 179. In order to throw some light on the causes of this disagreement, experiments were made to ascertain the effect of different amounts of iodine in excess, different times of absorption and different qualities of rosin.

Five samples were used representing different grades from "W.W." (water-white) rosin to "A" (black).

In the tests made to ascertain the influence of time and of excess of iodine the rosin used was that known as W.W., which is the best grade in the market. The iodine solution used contained twenty-five grams of iodine and thirty grams of mercuric chloride per liter, and the thiosulphate solution 24.8

grams of sodium thiosulphate per liter. The thiosulphate solution was standardized by means of a solution of potassium dichromate made from chemically pure dichromate which had been further purified by several recrystallizations. The tests were made in bottles of 250 cc. capacity, having carefully ground stoppers, such as are used in the assay of silver bullion. The rosin was in each case dissolved in ten cc. of chloroform and the absorption was effected in a dark closet.

The results were as follows:

Quality of rosin.	Quantity, grams.	Excess of iodine in cc. $\frac{N}{10}$ thiosulphate.	Time of absorption.	Iodine figure.
Water-white	0.3030	17.4	2 hours.	142.9
" "	0.3017	25.4	2 "	146.4
" "	0.3048	33.2	2 "	148.5
" "	0.3010	50.2	2 "	152.1
Water-white	0.3007	13.35	1 hour.	126.7
" "	0.3027	11.6	2 hours.	133.1
" "	0.3003	10.5	4 "	142.0
" "	0.3023	8.8	8 "	144.8
" "	0.3087	11.55	18 "	160.3
" "	0.3033	1.9	52 "	172.6
"A" (black)	0.3055	20.25	18 hours.	143.6
"E"	0.3012	14.2	18 "	156.4
"G"	0.3054	13.7	18 "	153.1
"W.G." (window-glass)	0.3160	9.7	18 "	164.2
"W.W." (water-white)	0.3087	11.55	18 "	160.3

It appears from these results that the average iodine absorption in eighteen hours by different qualities of rosin is 155.5, the average quantity of rosin used being 0.3073 grams and the average excess of iodine equivalent to 13.88 cc. $\frac{N}{10}$ thiosulphate. The darker samples of rosin absorb less iodine than the lighter ones which have been subjected to less heat. The variations due to different lengths of time and different amounts of iodine in excess are, however, so serious that comparatively little can be learned by Hübl's process as to the nature of an oil when rosin is present in any considerable quantity.