the analyses of different chemists. The errors thus obtained clearly arise from the too sudden formation of the ammonia-magnesia phosphate precipitate, the precipitate carrying down with it extraneous matter, the error increasing, of course, when a large amount of molybdate of ammonia is present. When no foreign matter is present and the exact theoretical amount of magnesium chloride is contained in the solution, this sudden precipitation is not injurious, as is seen in Method IV. Method III when carried out as here described gives accurate results even in the presence of molybdate of ammonia. This method, as it does not necessitate any previous neutralization of the solution with hydrochloric acid, and requires but one precipitation is the one to be most highly recommended. Strong ammonia water should be added in liberal amount to the solution, and also employed in the washing.

The breaking of the filter paper and washing of the molybdate salt into the beaker, without filtering the solution cannot be recommended. However thoroughly the yellow salt may be washed, there is always a slight residue insoluble in ammonia water. A solution and filtration of the molybdic precipitate is therefore necessary in accurate work.

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ABSTRACTS.

Abstracts from *Journal of the Chemical Society*. London, by Arthur H. Elliott, Ph. B., F.C.S.

On the Volnmetric Estimation of Bismuth in the Form of Oxalate. By M. M. PATTISON MUIR, M. A., F. R. S. E. AND C. E. ROBBS, B. A. B. Sc. (Vol. XL., p. 1.)—Authors describe a process which depends upon the fact that potassium oxalate precipitates Bismuth as $Bi_2(C_2O_4)_3K_2C_2O_4$. The method of procedure is as follows:—

A solution of the bismuth in the minimum quantity of nitric acid is evaporated till only enough acid remains to give a solution when hot; a large excess of glacial acetic acid is added and the whole transferred to a measuring flask, washing with acetic acid (1:1). Standard potassium oxalate is now added till there is twice as much of this salt present as there is bismuth oxide; the flask is filled to the mark with acetic acid (1:1) and after shaking and allowing to settle, a portion of the fluid is filtered through a dry filter and the excess of potassium oxalate determined by a standard solution of permanganate.

The bismuth must first be separated from other heavy metals preferably as oxychloride. The double bismuth and potassium oxalate is soluble in potassium oxalate: but precipitates with excess of strong acetic acid.

Action of Water on Bismuth Iodide. A Lecture Experiment. By M. M. Pattison Muir. (Vol. XL., p. 4.)—This experiment illustrates the influence of time, temperature, and mass, upon chemical change. Author pours solution of BiI_3 in hydriodic acid, into cold water, water at 90°—100° C. and large quantity of cold water. In the first brown $Bi\ I_3$ is formed, in the second red BiOI, and small quantity of red BiOI in the third.

Aluminium Alcohols. Part II. Their Products of Decomposition by Heat. By J. H. Gladstone, Ph. D., F. R. S., and Alfred Tribe, F. C. S. (Vol. XL., p. 5.)—This paper is a continuation of the highly interesting experiments of the Authors upon aluminium alcohols. The authors state that the general result of heating these alcohols is the formation of two sets of products,alumina and the alcohol and olefine, or alumina and the ether. They describe the products obtained by heating 1, aluminium phenylate, 2, aluminium para-cresylate. 3, aluminium thymolate; 4; aluminium beta-naphthylate, 5, aluminium gamma naphthylate. Among the products mentioned we note phenyl ether, cresyl-ether, metacresyl-ether, beta-naphthyl-ether. The paper is full of interesting facts and this abstract gives but a faint idea of the ground covered by the investigations.

On the Action of Oxides on Salts. Part IV. Potassic Chlorate and Ferric Oxide. By Edmund J. Mills, D. Sc., F. R. S., and George Donald. (Vol. XL., p. 18.)—Experiments of authors go to prove that practically 3 Fe_2O_3 will expel O_{10}. And in conclusion they state "that the case of chemical change which we have under consideration presents nothing abnormal or peculiar in its features. From the carbonate, an oxide of carbon is the matter expelled; from the chlorate, an oxide of oxygen." The name *catalysis* ceases to have any reason for its existence.

In a supplementary note it is stated that the action of manganese dioxide upon potassic chlorate is the same as that of an oxide on a salt.

Gamma and Beta-Amylan; Constituents of Some Cereals. By C. O'Sullivan. (Vol. XL., p. 24.) — Author describes two bodies of the same percentage composition as starch, one insoluble in water, and the other soluble. Barley contains 2 per cent. of gamma-amylan,and not more than 0.3 per cent. of beta-amylan. Wheat and rye contain 2.25 per cent. of beta-amylan, and not over 0.1—0.05 per cent. of gamma-amylan.

Note on the Action of Ethyl-Chlorocarbonate on Benzene in presence of Aluminum Chloride. By Edward H. Rennie, M. A., B. Sc. (Vol. XL., p. 33.)—Author states that ethyl-chlorocarbonate acts upon benzene in presence of alumina chloride in the cold producing carbonic anhydride, hydrochloric acid and *ethyl benzene.* Also states that ethyl-chlorocarbonate, by contact with aluminium chloride in the cold, yields carbonic anhydride and mono-chlorethene. When ethyl-chloroacetate is substituted for ethyl-chlorocarbonate, no reaction takes place.

On Benzyl-Phenol and its Derivatives. By Edward H. Rennie, M. A., B. Sc. (Vol. XL., p. 33.) — Author describes the preparation of the monosulphonic acid, potassium nitrobenzyl-phenol-sulphonate, potassium bromo-benzyl-phenol-sulphonate, and trinitro benzyl-phenol, and gives descriptions of their properties. Author appears to think that benzyl-phenol is a para derivative.

On the Steeping of Barley. By Edmund J. Mills, D. Sc., F.R.S., and J. Pettigrew. (Vol. XL., p. 38.) This paper treats of the action of water, containing different quantities of calcium carbonate and calcium sulphate in solution, upon barley. In the case of calcium carbonate, as the latter diminishes the extract decreases, and the nitrogenous matters in the extract increase; but distilled water extracts less of the nitrogen compounds than 0.0224 per cent. solution of calcium carbonate. With calcic sulphate the total extract or nitrogen per unit of calcic salts is much greater than with the carbonate. The paper also contains an analysis of Burton water, and its effect upon the steeping of barley. It is shown that the extract decreases as the water is diluted with distilled water. Factitious waters were made containing some of the important constituents of the Burton water; and as a result of steeping barley it was found that with calcic sulphate and sodic chloride, more extract and less nitrogenous matter was obtained than with Burton water; while with calcic carbonate and sodic chloride the extract is about the same and the nitrogen less than with Burton water. The general effect of a calcic solution is to keep back the nitrogen within the grain. "The special esteem in which the Burton water is held may therefore be due to its nitrate, which is well known to have a highly stimulant action in the germinating of malt—a process which demands much oxygen."

Researches on the Relation of the Molecular Stricture of Carbon Compounds to their Absorption Spectra. By W. N. Hartley, F. R. S. E. (Vol. XL., p. 45.) Part VI.—*On the constitution of Pyridine, Picoline, Quinoline, and Cyanuric Acid.*

After experimenting on Hydrocyanic Acid, the author comes to the conclusion that: "The simple union of carbon to nitrogen does not cause selective absorbtion of the ultra violet rays." A number of diagrams from photographs of absorption spectra are given and comparison is made between the different spectra. Author thinks it probable that in benzene each carbon atom is united with three other carbons. A full idea of the paper cannot be given without the diagrams.

On Peppermint Camphor(Menthol)and some of its Derivatives. By R. W. Atkinson, B. Sc., and H. Yoshida. (Vol. XL., p. 49.) Authors describe Menthone $C_{10}H_{18}O$, give its vapor density as 77.45 and 76.69; it boils at 206.3° C, and its specific rotary power is [alpha] j = + 21.16°. Its specific gravity at different temperatures as well as its rate of expansion and molecular refraction are also given. Menthone $C_{10}H_{18}$ is also described; it boils at 167.4° C, its specific gravity power is [alpha] j = + 13.25°. The specific gravity, rate of expansion and molecular refraction are also given.

On the Composition of Pennant Grits in Contact with and at a Distance from Carbonaceous Deposits. By Edward Wethered, F. C. S., F. G. S. (Vol. XL.,) A comparison of a number of analyses of the grits that accompany coal seams. The author finds that these become more argillaceous when in contact with the coal, and assigns the cause to the carbonic acid given off from the decomposing vegetable matter, acting upon the freshly formed inorganic sediment; decomposing all silicates except silicate of alumina.