14. *The Synthesis of Tartaric Acid.*

By A. C. C. Newman and H. L. Riley.

Although Schöyen (*Annalen*, 1864, **132**, 168) and Strecker (*Z. Chem.*, 1868, 216; *Bull. Soc. chim.*, 1868, **10**, 257) claim to have prepared tartaric acid from glyoxal through the cyanohydrin, the experimental proof of their statements is unsatisfactory. Pollak (*Monatsh.*, 1894, **15**, 469) states that under certain conditions he obtained *meso*tartaric acid in 4—15% yield.

Our attempts to prepare tartaric acid from glyoxal (now readily accessible; Riley, Morley, and Friend, J., 1932, 1881; Riley and Friend, *ibid.*, p. 2342) by the methods described by the above workers gave negligible yields of the racemic acid, and no *meso*tartaric acid was formed. Racemic acid was obtained in 30% yield by the following method.

A suspension of the crude glyoxal bisbisulphite compound (55 g.) (J., 1932, 1881) in H_2O (220 c.c.) was shaken with the theo. wt. of KCN (in the min. of H_2O), added slowly. The solution obtained was filtered, an equal vol. of conc. HCl added, and the mixture saturated with HCl and refluxed for 12 hr. Considerable charring occurred. The liquid was freed from most

of the HCl by boiling and neutralised with $Ca(OH)_2$. After 12 hr., the ppt. of calcium tartrate was collected, boiled in dil. HCl with animal charcoal, and repptd. by $Ca(OH)_2$ (Found: Ca, 15·6. Calc. for $C_4H_4O_6Ca,4H_2O$: Ca, 15·4%). The Ca salt was decomposed with an equiv. of 0·5*N*-H_2SO_4, the filtered solution evaporated on the steam-bath, and the residue extracted with cold H_2O; from the extract, on concn. and cooling, racemic acid separated, m. p. 206° (Found: C, 28·5; H, 4·8. Calc. for $C_4H_6O_6,H_2O$: C, 28·6; H, 4·8%).

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ARMSTRONG COLLEGE (UNIVERSITY OF DURHAM),
NEWCASTLE-ON-TYNE.

IMPERIAL COLLEGE, S.W. 7.

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