

RP-17

## NEWS AND NOTES

### POTASSIUM DIHYDROGEN ORTHO PHOSPHATE, A SUBSTITUTE FOR ORTHO PHOSPHORIC ACID IN MANGANESE ESTIMATION

THE interference of iron in colorimetric estimation of Mn is often met with during soil and plant analysis. Addition of  $H_3PO_4$  is the usually adopted practice to check this interference prior to developing the permanganate colour.<sup>1, 2</sup>  $H_3PO_4$  will also check the precipitation of Mn as  $MnO_2$  while oxidising the di or trivalent Mn to heptavalent Mn with  $KIO_4$ .<sup>3</sup> Mn-free  $H_3PO_4$  required for Mn estimation is not readily available sometimes.

In our attempts to find out a substitute for Mn-free  $H_3PO_4$ , potassium salt of ortho phosphoric acid ( $KH_2PO_4$ ) was found to be equally suitable for the colorimetric estimation of Mn. Twenty-four samples each of soil and plant were analysed for Mn in this laboratory using AR quality  $KH_2PO_4$  of BDH ("Analar") or of Sarabhai M. Chemicals ("Guaranteed Reagent"). The actual modified method adopted is described below.

To an aliquot of the 2 ml of sample extract, a 2 ml portion of 30% solution of  $KH_2PO_4$  was added in place of  $H_3PO_4$  (85%). The acidity of reaction was maintained by using A.R. (Analar)  $KNO_3$ . The rest of the procedure for the estimation of Mn was the same. The values obtained for water soluble, exchangeable, and easily reducible Mn fractions of soils as well as the Mn content of plant samples were perfectly in agreement with those obtained by using Mn-free  $H_3PO_4$ .

Statistical analysis of the comparative analytical results are presented in Table I.

Thus  $KH_2PO_4$  can not only substitute  $H_3PO_4$ , but it is also economical since there is a 92% saving in the cost. Mn-free  $NaH_2PO_4$  can also

TABLE I

Comparison of the results of Mn estimation using  $H_3PO_4$  and  $KH_2PO_4$

|  | Mean Mn values (ppm) |                 |
|--|----------------------|-----------------|
|  | Soil                 | Leaf            |
| Method of analysis                           |                      |                 |
| (1) using $H_3PO_4$ ..                       | 47.72                | 225.63          |
| (2) using $KH_2PO_4$ ..                      | 47.62                | 225.88          |
| Mean differences ..                          | 0.10                 | 0.25            |
| Value for paired differences<br><i>n</i> =24 | 1.90                 | 1.81            |
| Inference ..                                 | Not significant      | Not significant |

be used in place of  $H_3PO_4$  but  $KH_2PO_4$  would be cheaper.

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