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The direct determination of secondary phosphate.

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(by invitation).

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Saturated calcium sulfate added to a solution of primary and secondary phosphates precipitates the latter according to the equation

$$4Na_2HPO_4 + 3CaSO_4 \rightleftarrows Ca_3(PO_4)_2 + 2NaH_2PO_4 + 3Na_2SO_4.$$

The phosphorus of the secondary phosphate is equally distributed between the tricalcium phosphate and the monosodium phosphate. The primary phosphate does not precipitate and hence no primary phosphate present would be transformed into secondary phosphate.

Analysis of the precipitate thus obtained showed that it was $Ca_3(PO_4)_2$. Maximum precipitation occurs when the HPO_4 and $CaSO_4$ are in the molal ratio of 4:3 as determined by conductivity measurements. This establishes the equation above. Under these conditions the reaction gives 93 per cent precipitation. Completion can be attained when the $CaSO_4$ is present in five times the concentration of the HPO_4.

Data by the method published elsewhere[1] show that in the ratio of 1:19 or 19:1 primary phosphate does not interfere with the determination of secondary phosphate. If a simultaneous determination of the total phosphate is made, the ratio of primary and secondary phosphates and hence the hydrion concentration can be calculated.

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1 Kugelmass, I. N., and Rothwell, C., The direct determination of the secondary phosphate, *J. Biol. Chem.*, to appear.