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The Benfield solution which is a disposal liquid of the State Fertilizer Manufacturing Corporation, contains mainly potassium carbonate & bicarbonate, diethyl amine (DEA) and vanadium. Vanadium is present as both tetra and penta valent states. The content of potassium and vanadium in both states were determined after eliminating the DEA. Attempts were made to remove potassium from the Benfield solution as potassium sulphate and vanadium from the resulting solution as vanadium pentoxide. The precipitation of vanadium was studied and the experimental conditions have been optimized such that a simultaneous precipitation of both penta and tetra valent vanadium was achieved. Most of the potassium and vanadium in the Benfield solution were precipitated successfully in two successive steps.

The effect of pH on the speciation of vanadium was also studied spectrophotometrically, based on metavanadate-sulphuric acid - water system.

The factors influencing symmetry of the flow injection analysis (FIA) response were studied and tests were carried out to optimize the system. Vanadium(V) was analysed using the FIA technique under the optimum conditions. The FIA was coupled with solvent extraction using a phase segmentation device and a membrane phase separator consisting of Zitex (teflon) and Millipore (mitex) filter membranes. Vanadium(V) was extracted into toluene as its 8-hydroxy quinolene complex and was determined using the above FIA device. Both a peristaltic pump and an external pressure source were used to achieve a satisfactory phase separation.