

A STUDY ON THE RECOVERY OF VANADIUM AND POTASSIUM
FROM BENFIELD SOLUTION AND APPLICATION OF FIA-SOLVENT
EXTRACTION SYSTEM TO DETERMINE VANADIUM

K. Chintha Mirani Fonseka, H. Dasaratha Gunawardhana
Dept. of Chemistry, University of Colombo.

Benfield solution mainly contains potassium and both tetra and penta valent vanadium. Conditions under which the removal of potassium from the Benfield solution as potassium sulphate were studied. The precipitation of vanadium was studied with the resulting solution. Zurkov et al¹ have reported a study of meta vanadate - sulphuric acid system. Based on these theoretical and experimental deductions, we were successful in optimizing the conditions under which vanadium is precipitated as the oxide. A simultaneous precipitation of vanadium(V) and (IV) has been observed. Under these optimum conditions over 80% of vanadium in Benfield solution was successfully precipitated. These studies indicate that it is possible recover potassium and vanadium from the Benfield solution before the disposal of it into the sea.

The flow through cell in the Flow Injection Analysis (FIA) system had been modified to achieve better results². A membrane phase separator was incorporated and the system was tried out for the colorimetric determination of vanadium. The organic phase containing vanadium in the form of vanadium(V)-8-hydroxyquinolate complex was separated from the aqueous phase using zitex (teflon) and millipore (10 µm Mitex) membranes placed in the membrane phase separator. To achieve a satisfactory phase separation and a smooth flow of the two phases through the system both peristaltic pump and compressed air were used. The vanadium content in the benfield solution was determined by this system.

References

- Zurkov, L. and Ulicka, L. (1982) Chem. Zvesti., 36(6), 809
Hettipathirana, T.D. and Gunawardhana, H. Dasaratha, (1985)
Proc. Sri Lanka Assoc. Advmt. Sci., 41(1); 98.

09th Dec. 1987 (Wednesday) 09.30 a.m. - 09.45 a.m.