Gavazov K., Simeonova Z., Alexandrov A. *Extraction-spectrophotometric study of the system vanadium(V) – 4-(2-pyridylazo)resorcinol – 2,2',5,5'-tetraphenyl-3,3'-(p-biphenyl)ditetrazolium chloride – water – chloroform. Determination of vanadium in steels,* ***Analytical Laboratory***, **7** (3) (1998) 127-133.

A ternary ion-association complex of vanadium(V) with 4-(2-pyridylazo)resorcinol (PAR) and 2,2',5,5'-tetraphenyl-3,3'-(p-biphenyl)ditetrazolium chloride (NTC) V(V) : PAR : NTC = 2 : 4 : 3 was obtained, which is extracted into $CHCl_3$. The molar absorptivity of the complex at λ_{max}= 560 nm was calculated to be $\varepsilon = 3.69 \times 10^4$ lmol.cm. The optimum conditions for extraction (pH, concentration of reagents, time), as well as the distribution constant (log K_D = 1.26 ± 0.06), the association constant (log β = 7.19 ± 0.15), the extraction constant (log K_{ex} = 8.45 ± 0.21), and the recovery factor R (%) = 94.8 ± 0.7 were determined. The effect of foreign ions in the absence and in the presence of 1,2-diaminocyclohexane-N,N,N',N'-tetraacetic acid (CDTA) was studied. A direct sensitive and selective extraction-spectrophotometric method for determination of vanadium in steels was developed. In the presence of CDTA the molar absorptivity decreases by about 20%, but the determination of vanadium is not interfered by a 10000-fold excess of NH_4^+, K^+, Na^+, SO_4^{2-}, F^-, HPO_4^{2-}, $H_2PO_4^{2-}$, tartrate^{2-}; 5000-fold excess of citrate^{2-}; 2000-fold excess of Cd(II); 1500-fold excess of Pb(II), Cl^-; 1000-fold excess of Cr(III), Ni(II), Cu(II), Zn(II), Co(II), Re(VII), $C_2O_4^{2-}$; 800-fold excess of Ce(III); 750-fold excess of Ti; 600-fold excess of Fe(III); 300-fold excess of Al(III); 100-fold excess of Mn(II), Mo(II), NO_3^-; 70-fold excess of $Cr0_4^{2-}$; 50-fold excess of SO_3^{2-}; 5-fold excess of Nb(V); 4-fold excess of V(IV); 2-fold excess of W(VI); W(VI) and Nb(V) can easily be separated during the treatment of the sample. Beer's law is obeyed in the range of 1.5 - 35 μg of vanadium in 10 ml of chloroform extract.

Keywords: *Vanadium, 4-(2-Pyridylazo)resorcinol, 2,2: 5,5'-Tetraphenyl-3,3'-(p-bipheny)ditetrazolium* chl*oride, Extraction-spectrophotometric determination, Steel*