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 CHCl₃. The molar absorptivity of the complex at $\lambda_{\text{max}}$ = 560 nm was calculated to be $\varepsilon = 3.69 \times 10^4$ l/mol.cm. The optimum conditions for extraction (pH, concentration of reagents, time), as well as the distribution constant (log $K_D = 1.26 \pm 0.06$), the association constant (log $\beta = 7.19 \pm 0.15$), the extraction constant (log $K_{\text{ex}} = 8.45 \pm 0.21$), 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 NH₄⁺, K⁺, Na⁺, SO₄²⁻, F⁻, HPO₄²⁻, H₂PO₄⁻, tartrate²⁻; 5000-fold excess of citrate²⁻; 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), C₂O₄²⁻; 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), NO₃⁻; 70-fold excess of CrO₄²⁻; 50-fold excess of SO₃²⁻; 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-biphenyl)ditetrazolium chloride, Extraction-spectrophotometric determination, Steel