Abstract Facilitated transport of Ni(II) ions across a supported liquid membrane (SLM) by
dithiophosphonates dissolved in methanol as carrier has been investigated. In this
work, the
SLMs were composed of ionic ligands ammonium-O-ethyl (4-methoxyphenyl)
dithiophosphonate (L1), ammonium-O-propyl (4-methoxyphenyl) dithiophosphonate
(L2),
ammonium-O-isopropyl (4-methoxyphenyl) dithiophosphonate (L3) and ammonium-O-
butyl
(4-methoxyphenyl) dithiophosphonate (L4) as the carriers.
Polyvinylidene fluoride (PVDF) hydrophobic microporous membrane was used as
support.
The experiments were carried out at various operating conditions such as feed phase
pH,
receiver phase concentration, carrier concentration in the membrane phase, different
valence
metal ion and SLM stability. The morphology of SLMs was characterized using
scanning
electron microscopy (SEM), atomic force microscopy (AFM) and fourier transform
infrared
spectroscopy (FTIR). The SEM, AFM and FTIR images, comparing the PVDF
membrane
support to SLMs, indicate that the surface morphologies of the membranes are
different. The
flux values (J) and recovery factors (RF) of Ni(II) ions were obtained at optimum pH 2.
Similar flux results were obtained for all SLMs at optimum condition and in a period of
8 h.
Increase in carrier concentration inside the membrane enhances Ni(II) concentration
with its
maximum value at 4.0x10⁻¹ mol/L carrier.