The ethylene absorption capacities of six nonaqueous reactive absorption solutions have been investigated by cyclic voltammetry and equilibrium cell experiments. Validation of the electrochemical method as a novel screening technique for ethylene-absorbing solutions was accomplished by qualitative comparison to equilibrium cell results. Metal salt—ligand pairs included combinations of cuprous chloride and cuprous bromide salts with pyridine, benzylamine, and aniline. The cyclic voltammetry experiments at 0.01 M copper concentration included multiple ligand concentrations over a range of scan rates to identify trends in ethylene complexation. Equilibrium cell experiments near 1 M copper were useful in examining chemical and physical effects as well as quantifying the ethylene capacity of the solutions at higher metal loadings. Results from both techniques suggested that the solution with the best ethylene capacity consisted of cuprous chloride with aniline ligand.


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