



CHAPTER I INTRODUCTION

The presence of organic contaminants from the chemical industry in wastewater and groundwater is a major concern (Breen and Dellarco, 1992). Halogenated organic compounds are of particular concern in many plant wastewaters and are found extensively in groundwater and soil as a result of the improper design of hazardous waste disposal facilities, accidental spills, and the leakage of underground storage tanks, among other commercial and industrial sources (Mazare and Mackay, 1993).

Froth flotation can be used to remove organic compounds (either dissolved or as a separate phase) from water (Scamehorn and Harwell, 1988) as a low-energy separation process. In previous work (Pongstabodee, Scamehorn, Chavadej, and Harwell, Submitted), has shown that emulsified σ -dichlorobenzene (ODCB) can be removed from water most effectively when conditions favor formation of a third equilibrium phase between the oil and water phases (Winsor type III microemulsion). In that work, single ionic surfactants were investigated and microemulsion behavior was induced by addition of salt. Before enough salt could be added to induce type III microemulsion formation over a wide range of conditions, surfactant precipitation occurred. In order to inhibit this precipitation and to investigate synergisms in the use of surfactant mixtures, in this work, a mixture of an anionic and a nonionic surfactant was investigated for froth flotation of ODCB.