

List of Figures:

Figure 2.1: Most common cation in ionic liquids	10
Figure 2.2: Most common anion in ionic liquids	11
Figure 2.3: Most common cations in protic ionic liquids	12
Figure 2.4: Most common anions in protic ionic liquids	13
Figure 2.5: Schematic diagram of UCST and LCST phase behaviour in a mixture	19
Figure 3.1: Temperature controlling technique	24
Figure 3.2: Summary of technique used in composition studies	27
Figure 4.1(a): Chemical structure of bis-(2-ethylhexyl)ammonium tosylate	28
Figure 4.1(b): Chemical structure of tris-(2-ethylhexyl)ammonium tosylate	29
Figure 4.2: Samples of the synthesized protic ionic liquids	29
Figure 4.3: Phase behaviour of bis-(2-ethylhexyl)ammonium tosylate/ water/ isopropanol system	38
Figure 4.4: Phase behaviour of tris-(2-ethylhexyl)ammonium tosylate/ water/ isopropanol system	39
Figure 4.5: Chemical structure: hindrance effect on both protic ionic liquids	50
Figure 4.6: Classification of integrated N-H proton observed on both ternary mixtures ...	51
Figure 4.7: General composition analysis method overview	52
Figure 4.8(a): Data plot for bis-(2-ethylhexyl)ammonium tosylate composition in both phases in bis-(2-ethylhexyl)ammonium tosylate/ water/ isopropanol system	55
Figure 4.8(b): Data plot for water composition in both phases in bis-(2-ethylhexyl)ammonium tosylate/ water/ isopropanol system	55
Figure 4.8(c): Data plot for isopropanol composition in both phases in bis-(2-ethylhexyl)ammonium tosylate/ water/ isopropanol system	56
Figure 4.9(a): Data plot for tris (2-ethylhexyl) ammonium tosylate composition in both phases in tris-(2-ethylhexyl)ammonium tosylate/ water/ isopropanol system	58
Figure 4.9(b): Data plot for water composition in both phases in tris-(2-ethylhexyl)ammonium tosylate/ water/ isopropanol system	58

Figure 4.9(c): Data plot for isopropanol composition in both phases in tris-(2-ethylhexyl)ammonium tosylate/ water/ isopropanol system59