Figure Index

CHAPTER - 3: THEORETICAL CONSIDERATIONS

<table>
<thead>
<tr>
<th>Figure Number</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fig. 1</td>
<td>Slope of Equilibrium/Distribution Curve</td>
<td>35</td>
</tr>
<tr>
<td>Fig. 2</td>
<td>Right Angle Triangular Diagram</td>
<td>35</td>
</tr>
<tr>
<td>Fig. 3</td>
<td>Determination of Plait Point Composition</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Graphical Technique.</td>
<td></td>
</tr>
</tbody>
</table>

CHAPTER- 4: EXPERIMENTAL

<table>
<thead>
<tr>
<th>Figure Number</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fig. . I</td>
<td>Experimental Set up for Packed column.</td>
<td>140</td>
</tr>
<tr>
<td>Fig. . II</td>
<td>Schematic diagram of Liquid-liquid Extraction Unit.</td>
<td>141</td>
</tr>
</tbody>
</table>

XXX
## Figure Index

**CHAPTER - 5: RESULTS AND DISCUSSION FOR QUATERNARY LIQUID-LIQUID PHASE EQUILIBRIUM DATA**

<table>
<thead>
<tr>
<th>Figure Number</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mutual Solubility Data:</strong>[M]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fig. M-.1</td>
<td>Mutual Solubility data of antisolvent effect as parameters for system B-H-100/90/80%Dmf-0/10/20% W at 20 °C</td>
<td>169</td>
</tr>
<tr>
<td>Fig. M-.2</td>
<td>Mutual Solubility data of antisolvent effect as parameters for system B-H-100/90/80%Dmf-0/10/20% W at 30 °C</td>
<td>170</td>
</tr>
<tr>
<td>Fig. M-.3</td>
<td>Mutual Solubility data of antisolvent effect as parameters for system B-H-100/90/80%Dmf-0/10/20% W at 40 °C</td>
<td>171</td>
</tr>
<tr>
<td>Fig. M-.4</td>
<td>Mutual Solubility data of antisolvent effect as parameters for system T-H-100/90/80%Dmf-0/10/20% W at 20 °C</td>
<td>174</td>
</tr>
<tr>
<td>Fig. M-.5</td>
<td>Mutual Solubility data of antisolvent effect as parameters for system T-H-100/90/80%Dmf-0/10/20% W at 30 °C</td>
<td>175</td>
</tr>
<tr>
<td>Fig. M-.6</td>
<td>Mutual Solubility data of antisolvent effect as parameters for system T-H-100/90/80%Dmf-0/10/20% W at 40 °C</td>
<td>176</td>
</tr>
<tr>
<td>Fig. M-.7</td>
<td>Mutual Solubility data of antisolvent effect as parameters for system X-H-100/90/80%Dmf-0/10/20% W at 20 °C</td>
<td>178</td>
</tr>
<tr>
<td>Fig. M-.8</td>
<td>Mutual Solubility data of antisolvent effect as parameters for system X-H-100/90/80%Dmf-0/10/20% W at 30 °C</td>
<td>179</td>
</tr>
<tr>
<td>Fig. M-.9</td>
<td>Mutual Solubility data of antisolvent effect as parameters for system X-H-100/90/80%Dmf-0/10/20% W at 40 °C</td>
<td>180</td>
</tr>
<tr>
<td>Fig. M-10</td>
<td>Mutual Solubility data of antisolvent effect as parameters for system B-H'-100/90/80%Dmf-0/10/20% W at 20 °C</td>
<td>182</td>
</tr>
<tr>
<td>Fig. M-11</td>
<td>Mutual Solubility data of antisolvent effect as parameters for system B-H'-100/90/80%Dmf-0/10/20% W at 30 °C</td>
<td>183</td>
</tr>
<tr>
<td>Fig. M-12</td>
<td>Mutual Solubility data of antisolvent effect as parameters for system B-H'-100/90/80%Dmf-0/10/20% W at 40 °C</td>
<td>184</td>
</tr>
</tbody>
</table>
Fig. M-13 Mutual Solubility data of antisolvent effect as parameters for system B-Oct-100/90/80%DMF-0/10/20% W at 20 °C

Fig. M-14 Mutual Solubility data of antisolvent effect as parameters for system B-Oct-100/90/80%DMF-0/10/20% W at 30 °C

Fig. M-15 Mutual Solubility data of antisolvent effect as parameters for system B-Oct-100/90/80%DMF-0/10/20% W at 40 °C

Fig. M-16 Mutual Solubility data of antisolvent effect as parameters for system B-H-100/90/80%DMSO-0/10/20% W at 20 °C

Fig. M-17 Mutual Solubility data of antisolvent effect as parameters for system B-H-100/90/80%DMSO-0/10/20% W at 30 °C

Fig. M-18 Mutual Solubility data of antisolvent effect as parameters for system B-H-100/90/80%DMSO-0/10/20% W at 40 °C

Fig. M-19 Mutual Solubility data of antisolvent effect as parameters for system T-H-100/90/80%DMSO-0/10/20% W at 20 °C

Fig. M-20 Mutual Solubility data of antisolvent effect as parameters for system T-H-100/90/80%DMSO-0/10/20% W at 30 °C

Fig. M-21 Mutual Solubility data of antisolvent effect as parameters for system T-H-100/90/80%DMSO-0/10/20% W at 40 °C

Fig. M-22 Mutual Solubility data of antisolvent effect as parameters for system X-H-100/90/80%DMSO-0/10/20% W at 20 °C

Fig. M-23 Mutual Solubility data of antisolvent effect as parameters for system X-H-100/90/80%DMSO-0/10/20% W at 30 °C

Fig. M-24 Mutual Solubility data of antisolvent effect as parameters for system X-H-100/90/80%DMSO-0/10/20% W at 40 °C

Fig. M-25 Mutual Solubility data of antisolvent effect as parameters for system B-HEP-100/90/80%DMSO-0/10/20% W at 20 °C

Fig. M-26 Mutual Solubility data of antisolvent effect as parameters for system B-HEP-100/90/80%DMSO-0/10/20% W at 30 °C

Fig. M-27 Mutual Solubility data of antisolvent effect as parameters for system B-HEP-100/90/80%DMSO-0/10/20% W at 40 °C

Fig. M-28 Mutual Solubility data of antisolvent effect as parameters for system B-Oct-100/90/80%DMSO-0/10/20% W at 20 °C
Fig. M-29 Mutual Solubility data of antisolvent effect as parameters for system B-Oct-100/90/80% Dmso-0/10/20% W at 30 °C

Fig. M-30 Mutual Solubility data of antisolvent effect as parameters for system B-Oct-100/90/80% Dmso-0/10/20% W at 40 °C

Diagram for Tie line data [T]:

Fig. T-1 Tie line data for the Quaternary System
Beneze(B) - Hexane (H) - Dmf(D) + Water(W) at 20°C
with antisolvent concentration as a parameter

Fig. T-2 Tie line data for the Quaternary System
Benzene(B) - Hexane (H) - Dmf(D) + Water(W) at 30°C
with antisolvent concentration as a parameter

Fig. T-3 Tie line data for the Quaternary System
Benzene(B) - Hexane (H) - Dmf(D) + Water(W) at 40°C
with antisolvent concentration as a parameter

Fig. T-4 Tie line data for the Quaternary System
Toluene (T) - Hexane (H) - Dmf(D) + Water(W) at 20°C
with antisolvent concentration as a parameter

Fig. T-5 Tie line data for the Quaternary System
Toluene (T) - Hexane (H) - Dmf(D) + Water(W) at 30°C
with antisolvent concentration as a parameter

Fig. T-6 Tie line data for the Quaternary System
Toluene (T) - Hexane (H) - Dmf(D) + Water(W) at 40°C
with antisolvent concentration as a parameter

Fig. T-7 Tie line data for the Quaternary System
Xylene(X) - Hexane (H) - Dmf(D) + Water(W) at 20°C
with antisolvent concentration as a parameter

Fig. T-8 Tie line data for the Quaternary System
Xylene(X) - Hexane (H) - Dmf(D) + Water(W) at 30°C
with antisolvent concentration as a parameter

Fig. T-9 Tie line data for the Quaternary System
Xylene(X) - Hexane (H) - Dmf(D) + Water(W) at 40°C
with antisolvent concentration as a parameter
Fig. T-10 Tie line data for the Quaternary System
   Benzene(B)-Hept(H')-Dmf(D) + Water(W) at 20°C
   with antisolvent concentration as a parameter

Fig. T-11 Tie line data for the Quaternary System
   Benzene(B)-Hept(H')-Dmf(D) + Water(W) at 30°C
   with antisolvent concentration as a parameter

Fig. T-12 Tie line data for the Quaternary System
   Benzene(B)-Hept(H')-Dmf(D) + Water(W) at 40°C
   with antisolvent concentration as a parameter

Fig. T-13 Tie line data for the Quaternary System
   Benzene(B)-Oct(O)-Dmf(D) + Water(W) at 20°C
   with antisolvent concentration as a parameter

Fig. T-14 Tie line data for the Quaternary System
   Benzene(B)-Oct(O)-Dmf(D) + Water(W) at 30°C
   with antisolvent concentration as a parameter

Fig. T-15 Tie line data for the Quaternary System
   Benzene(B)-Oct(O)-Dmf(D) + Water(W) at 40°C
   with antisolvent concentration as a parameter

Fig. T-16 Tie line data for the Quaternary System
   Benzene(B)-Hexane (H)-Dmso(D') + Water(W) at 20°C
   with antisolvent concentration as a parameter

Fig. T-17 Tie line data for the Quaternary System
   Benzene(B)-Hexane (H)-Dmso(D') + Water(W) at 30°C
   with antisolvent concentration as a parameter

Fig. T-18 Tie line data for the Quaternary System
   Benzene(B)-Hexane (H)-Dmso(D') + Water(W) at 40°C
   with antisolvent concentration as a parameter

Fig. T-19 Tie line data for the Quaternary System
   Toluene (T) Hexane (H)-Dmso(D') + Water(W) at 20°C
   with antisolvent concentration as a parameter

xxxiv
Fig. T-20 Tie line data for the Quaternary System
Toluene (T) Hexane (H) - Dmso (D') + Water (W) at 30°C with antisolvent concentration as a parameter

Fig. T-21 Tie line data for the Quaternary System
Toluene (T) Hexane (H) - Dmso (D') + Water (W) at 40°C with antisolvent concentration as a parameter

Fig. T-22 Tie line data for the Quaternary System
Xylene (X) - Hexane (H) - Dmso (D') + Water (W) at 20°C with antisolvent concentration as a parameter

Fig. T-23 Tie line data for the Quaternary System
Xylene (X) - Hexane (H) - Dmso (D') + Water (W) at 30°C with antisolvent concentration as a parameter

Fig. T-24 Tie line data for the Quaternary System
Xylene (X) - Hexane (H) - Dmso (D') + Water (W) at 40°C with antisolvent concentration as a parameter

Fig. T-25 Tie line data for the Quaternary System
Benzene (B) - Hept (H') - Dmso (D') + Water (W) at 20°C with antisolvent concentration as a parameter

Fig. T-26 Tie line data for the Quaternary System
Benzene (B) - Hept (H') - Dmso (D') + Water (W) at 30°C with antisolvent concentration as a parameter

Fig. T-27 Tie line data for the Quaternary System
Benzene (B) - Hept (H') - Dmso (D') + Water (W) at 40°C with antisolvent concentration as a parameter

Fig. T-28 Tie line data for the Quaternary System
Benzene (B) - Oct (O) - Dmso (D') + Water (W) at 20°C with antisolvent concentration as a parameter

Fig. T-29 Tie line data for the Quaternary System
Benzene (B) - Oct (O) - Dmso (D') + Water (W) at 30°C with antisolvent concentration as a parameter

Fig. T-30 Tie line data for the Quaternary System
Benzene (B) - Oct (O) - Dmso (D') + Water (W) at 40°C with antisolvent concentration as a parameter
Distribution Diagrams and Selectivity Diagrams [D and S]

Fig. D-1 Distribution Diagrams for system: B-H-Dmf+W at different temperatures with anti solvent concentrations as a parameter

Fig. S-1 Selectivity Diagrams for system: B-H-Dmf-W at different temperature with anti solvent concentrations as a parameter.

Fig. D-2 Distribution Diagrams for system: T-H-Dmf+W at different temperatures with anti solvent concentrations as a parameter

Fig. S-2 Selectivity Diagrams for system: T-H-Dmf-W at different temperature with anti solvent concentrations as a parameter.

Fig. D-3 Distribution Diagrams for system: X-H-Dmf+W at different temperatures with anti solvent concentrations as a parameter

Fig. S-3 Selectivity Diagrams for system: X-H-Dmf-W at different temperature with anti solvent concentrations as a parameter.

Fig. D-4 Distribution Diagrams for system: B-Hep-Dmf+W at different temperatures with anti solvent concentrations as a parameter

Fig. S-4 Selectivity Diagrams for system: B-Hep-Dmf-W at different temperature with anti solvent concentrations as a parameter.

Fig. D-5 Distribution Diagrams for system: B-Oct-Dmf+W at different temperatures with anti solvent concentrations as a parameter

Fig. S-5 Selectivity Diagrams for system: B-Oct-Dmf-W at different temperature with anti solvent concentrations as a parameter.

Fig. D-6 Distribution Diagrams for system: B-H-Dmso+W at different temperatures with anti solvent concentrations as a parameter

Fig. S-6 Selectivity Diagrams for system: B-H-Dmso-W at different temperature with anti solvent concentrations as a parameter.

Fig. D-7 Distribution Diagrams for system: T-H-Dmso+W at different temperatures with anti solvent concentrations as a parameter

Fig. S-7 Selectivity Diagrams for system: T-H-Dmso-W at different temperature with anti solvent concentrations as a parameter.

Fig. D-8 Distribution Diagrams for system: X-H-Dmso+W at different temperatures with anti solvent concentrations as a parameter

Fig. S-8 Selectivity Diagrams for system: X-H-Dmso-W at different temperature with anti solvent concentrations as a parameter.
Fig. D-9  Distribution Diagrams for system: B-Hep-Dmsow+W at different
temperatures with anti solvent concentrations as a parameter

Fig. S-9  Selectivity Diagrams for system: B-Hep-Dmsow-W at different
temperature with anti solvent concentrations as a parameter.

Fig. D-10 Distribution Diagrams for system: B-Oct-Dmsow+W at different
temperatures with anti solvent concentrations as a parameter

Fig. S-10 Selectivity Diagrams for system: B-Oct-Dmsow-W at different
temperature with anti solvent concentrations as a parameter.

Fig. D-11 Distribution Diagrams for system: B-H-Dmf+W at different
anti solvent concentrations with temperatures as a parameter

Fig. S-11 Selectivity Diagrams for system: B-H-Dmf-W at different
anti solvent concentrations with temperatures as a parameter.

Fig. D-12 Distribution Diagrams for system: T-H-Dmf+W at different
anti solvent concentrations with temperatures as a parameter

Fig. S-12 Selectivity Diagrams for system: T-H-Dmf-W at different
anti solvent concentrations with temperatures as a parameter.

Fig. D-13 Distribution Diagrams for system: X-H-Dmf+W at different
anti solvent concentrations with temperatures as a parameter

Fig. S-13 Selectivity Diagrams for system: X-H-Dmf-W at different
anti solvent concentrations with temperatures as a parameter.

Fig. D-14 Distribution Diagrams for system: B-Hep-Dmf+W at different
anti solvent concentrations with temperatures as a parameter

Fig. S-14 Selectivity Diagrams for system: B-Hep-Dmf-W at different
anti solvent concentrations with temperatures as a parameter.

Fig. D-15 Distribution Diagrams for system: B-Oct-Dmf+W at different
anti solvent concentrations with temperatures as a parameter

Fig. S-15 Selectivity Diagrams for system: B-Oct-Dmf-W at different
anti solvent concentrations with temperatures as a parameter.

Fig. D-16 Distribution Diagrams for system: B-H-Dmsow+W at different
anti solvent concentrations with temperatures as a parameter

Fig. S-16 Selectivity Diagrams for system: B-H-Dmsow-W at different
anti solvent concentrations with temperatures as a parameter.
Fig. D-25 Distribution Diagrams for system: B-T-X-90%Dmso+10%W at different temperatures with molecular weight of Aromatic as a parameter.

Fig. S-25 Selectivity Diagrams for system: B-T-X-90%Dmso+10%W at different temperatures with molecular weight of Aromatic as a parameter.

Fig. D-26 Distribution Diagrams for system: B-T-X-80%Dmso+20%W at different temperatures with molecular weight of Aromatic as a parameter.

Fig. S-26 Selectivity Diagrams for system: B-T-X-80%Dmso+20%W at different temperatures with molecular weight of Aromatic as a parameter.

Fig. D-27 Distribution Diagrams for system: B-H-Hep-Oct-Dmf+0%W at different temperatures with molecular weight of Aliphatic as a parameter.

Fig. S-27 Selectivity Diagrams for system: B-H-Hep-Oct-Dmf+0%W at different temperatures with molecular weight of Aliphatic as a parameter.

Fig. D-28 Distribution Diagrams for system: B-H-Hep-Oct-90%Dmf+10%W at different temperatures with molecular weight of Aliphatic as a parameter.

Fig. S-28 Selectivity Diagrams for system: B-H-Hep-Oct-90%Dmf+10%W at different temperatures with molecular weight of Aliphatic as a parameter.

Fig. D-29 Distribution Diagrams for system: B-H-Hep-Oct-80%Dmf+20%W at different temperatures with molecular weight of Aliphatic as a parameter.

Fig. S-29 Selectivity Diagrams for system: B-H-Hep-Oct-80%Dmf+20%W at different temperatures with molecular weight of Aliphatic as a parameter.

Fig. D-30 Distribution Diagrams for system: B-H-Hep-Oct-Dmso+0%W at different temperatures with molecular weight of Aliphatic as a parameter.

Fig. S-30 Selectivity Diagrams for system: B-H-Hep-Oct-Dmso+0%W at different temperatures with molecular weight of Aliphatic as a parameter.

Fig. D-31 Distribution Diagrams for system: B-H-Hep-Oct-90%Dmso+10%W at different temperatures with molecular weight of Aliphatic as a parameter.

Fig. S-31 Selectivity Diagrams for system: B-H-Hep-Oct-90%Dmso+10%W at different temperatures with molecular weight of Aliphatic as a parameter.

Fig. D-32 Distribution Diagrams for system: B-H-Hep-Oct-80%Dmso+20%W at different temperatures with molecular weight of Aliphatic as a parameter.

Fig. S-32 Selectivity Diagrams for system: B-H-Hep-Oct-80%Dmso+20%W at different temperatures with molecular weight of Aliphatic as a parameter.
Plots for Four Correlations under consideration

Fig. -I Different Correlation for the system B-H-Dmf + W at 30°C
Fig. –II Different Correlation for the system B-H-Dmso + W at 30°C

Hand's plots for Different Systems[H]

Fig.H -1 Hand's Plot for System : B-H-Dmf-Water
with temperature and anti solvent concentration as parameter

Fig.H -2 Hand's plot for System : T-H-Dmf-Water
with temperature and anti solvent concentration as parameter

Fig.H - 3 Hand's plot for System : X-H-Dmf-Water
with temperature and anti solvent concentration as parameter

Fig.H - 4 Hand's plot for System : B-Hept- Dmf-Water
with temperature and anti solvent concentration as parameter

Fig.H - 5 Hand's plot for System : B-Oct-Dmf-Water
with temperature and anti solvent concentration as parameter

Fig.H - 6 Hand's plot for System : B-H-Dmso-Water
with temperature and anti solvent concentration as parameter

Fig.H - 7 Hand's plot for System : T-H-Dmso-Water
with temperature and anti solvent concentration as parameter

Fig.H - 8 Hand's plot for System : X-H-Dmso-Water
with temperature and anti solvent concentration as parameter

Fig.H - 9 Hand's plot for System : B-Hept-Dmso-Water
with temperature and anti solvent concentration as parameter

Fig.H -10 Hand's plot for System : B-Oct-Dmso-Water
with temperature and anti solvent concentration as parameter
Generalized Correlation Plots

Fig.GC-1 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{2.5}.
for the development of Generalized correlation for system: B-H-Dmf-W

Fig.GC-2 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{2.75}.
for the development of Generalized correlation for system: B-H-Dmf-W

Fig.GC-3 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{3}.
for the development of Generalized correlation for system: B-H-Dmf-W

Fig.GC-4 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{2.5}.
for the development of Generalized correlation for system: T-H-Dmf-W

Fig.GC-5 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{2.75}.
for the development of Generalized correlation for system: T-H-Dmf-W

Fig.GC-6 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{3}.
for the development of Generalized correlation for system: T-H-Dmf-W

Fig.GC-7 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{2.5}.
for the development of Generalized correlation for system: X-H-Dmf-W

Fig.GC-8 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{2.75}.
for the development of Generalized correlation for system: X-H-Dmf-W

Fig.GC-9 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{3}.
for the development of Generalized correlation for system: X-H-Dmf-W

Fig.GC-10 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{2.75}.
for the development of Generalized correlation for system: X-H-Dmf-W

Fig.GC-11 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{3}.
for the development of Generalized correlation for system: X-H-Dmf-W

Fig.GC-12 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{3.25}.
for the development of Generalized correlation for system: B-H-Dmf-W

Fig.GC-13 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{2.75}.
for the development of Generalized correlation for system: T-H-Dmf-W

Fig.GC-14 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{3}.
for the development of Generalized correlation for system: T-H-Dmf-W

Fig.GC-15 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{3.25}.
for the development of Generalized correlation for system: T-H-Dmf-W

Fig.GC-16 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{2.75}.
for the development of Generalized correlation for system: X-H-Dmf-W

Fig.GC-17 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{3}.
for the development of Generalized correlation for system: X-H-Dmf-W

Fig.GC-18 Plots of $\log k$ Vs, $\log T' \log [(S+W)/S]$^{3.25}.
for the development of Generalized correlation for system: X-H-Dmf-W
Fig. GC-19 Plots of log k Vs, log T' + log[(S+W)/S]^0.5.
for the development of Generalized correlation for system: B-Hep-DMf-W

Fig. GC-20 Plots of log k Vs, log T' + log[(S+W)/S]^0.75.
for the development of Generalized correlation for system: B-Hep-DMf-W

Fig. GC-21 Plots of log k Vs, log T' + log[(S+W)/S]^-1.
for the development of Generalized correlation for system: B-Hep-DMf-W

Fig. GC-22 Plots of log k Vs, log T' + log[(S+W)/S]^0.75.
for the development of Generalized correlation for system: B-Hep-DMf-W

Fig. GC-23 Plots of log k Vs, log T' + log[(S+W)/S]^-1.
for the development of Generalized correlation for system: B-Hep-DMf-W

Fig. GC-24 Plots of log k Vs, log T' + log[(S+W)/S]^-1.25.
for the development of Generalized correlation for system: B-Hep-DMf-W

Fig. GC-25 Plots of log k Vs, log T' + log[(S+W)/S]^0.25.
for the development of Generalized correlation for system: B-Oct-DMf-W

Fig. GC-26 Plots of log k Vs, log T' + log[(S+W)/S]^0.5.
for the development of Generalized correlation for system: B-Oct-DMf-W

Fig. GC-27 Plots of log k Vs, log T' + log[(S+W)/S]^0.75.
for the development of Generalized correlation for system: B-Oct-DMf-W

Fig. GC-28 Plots of log k Vs, log T' + log[(S+W)/S]^0.5.
for the development of Generalized correlation for system: B-Oct-DMf-W

Fig. GC-29 Plots of log k Vs, log T' + log[(S+W)/S]^0.75.
for the development of Generalized correlation for system: B-Oct-DMf-W

Fig. GC-30 Plots of log k Vs, log T' + log[(S+W)/S]^1.
for the development of Generalized correlation for system: B-Oct-DMf-W

Fig. GC-31: Plots of log k Vs, log T' + log[(S+W)/S]^2.5
for the development of Generalized correlation for system: B-H-Dmso-W

Fig. GC-32 Plots of log k Vs, log T' + log[(S+W)/S]^2.75
for the development of Generalized correlation for system: B-H-Dmso-W

Fig. GC-33 Plots of log k Vs, log T' + log[(S+W)/S]^3
for the development of Generalized correlation for system: B-H-Dmso-W

Fig. GC-34 Plots of log k Vs, log T' + log[(S+W)/S]^2.5
for the development of Generalized correlation for system: T-H-Dmso-W

Fig. GC-35 Plots of log k Vs, log T' + log[(S+W)/S]^2.75
for the development of Generalized correlation for system: T-H-Dmso-W

Fig. GC-36 Plots of log k Vs, log T' + log[(S+W)/S]^3
for the development of Generalized correlation for system: T-H-Dmso-W

Fig. GC-37 Plots of log k Vs, log T' + log[(S+W)/S]^0.333
for the development of Generalized correlation for system: X-H-Dmso-W

Fig. GC-38 Plots of log k Vs, log T' + log[(S+W)/S]^0.5
for the development of Generalized correlation for system: X-H-Dmso-W
Fig.GC-39 Plots of log k Vs, log T+log[(S+W)/S]^{0.75} for the development of Generalized correlation for system: X-H-Dmso-W

Fig.GC-40 Plots of log k Vs, log T+log[(S+W)/S]-2.75 for the development of Generalized correlation for system: B-H-Dmso-W

Fig.GC-41 Plots of log k Vs, log T+log[(S+W)/S]^{3} for the development of Generalized correlation for system: B-H-Dmso-W

Fig.GC-42 Plots of log k Vs, log T+log[(S+W)/S]^{-2.25} for the development of Generalized correlation for system: B-H-Dmso-W

Fig.GC-43 Plots of log k Vs, log T+log[(S+W)/S]^{2.75} for the development of Generalized correlation for system: T-H-Dmso-W

Fig.GC-44 Plots of log k Vs, log T+log[(S+W)/S]^{-2.75} for the development of Generalized correlation for system: T-H-Dmso-W

Fig.GC-45 Plots of log k Vs, log T+log[(S+W)/S]^{-3.25} for the development of Generalized correlation for system: T-H-Dmso-W

Fig.GC-46 Plots of log k Vs, log T+log[(S+W)/S]^{-0.75} for the development of Generalized correlation for system: X-H-Dmso-W

Fig.GC-47 Plots of log k Vs, log T+log[(S+W)/S]^{-1} for the development of Generalized correlation for system: X-H-Dmso-W

Fig.GC-48 Plots of log k Vs, log T+log[(S+W)/S]^{-1.25} for the development of Generalized correlation for system: X-H-Dmso-W

Fig.GC-49 Plots of log k Vs, log T+log[(S+W)/S]^{-0.5} for the development of Generalized correlation for system: B-Hep-Dmso-W

Fig.GC-50 Plots of log k Vs, log T+log[(S+W)/S]^{-0.75} for the development of Generalized correlation for system: B-Hep-Dmso-W

Fig.GC-51 Plots of log k Vs, log T+log[(S+W)/S]^{-1} for the development of Generalized correlation for system: B-Hep-Dmso-W

Fig.GC-52 Plots of log k Vs, log T+log[(S+W)/S]^{-1.25} for the development of Generalized correlation for system: B-Hep-Dmso-W

Fig.GC-53 Plots of log k Vs, log T+log[(S+W)/S]^{-1.5} for the development of Generalized correlation for system: B-Hep-Dmso-W

Fig.GC-54 Plots of log k Vs, log T+log[(S+W)/S]^{-1.75} for the development of Generalized correlation for system: B-Hep-Dmso-W

Fig.GC-55 Plots of log k Vs, log T+log[(S+W)/S]^{-0.5} for the development of Generalized correlation for system: B-Oct-Dmso-W

Fig.GC-56 Plots of log k Vs, log T+log[(S+W)/S]^{-0.75} for the development of Generalized correlation for system: B-Oct-Dmso-W

Fig.GC-57 Plots of log k Vs, log T+log[(S+W)/S]^{-1} for the development of Generalized correlation for system: B-Oct-Dmso-W
Fig.GC-77  Plots of log k Vs, X6 for the development of Generalized correlation for systems B/T/X-H-Dmf-W and B-H'-Dmf-W
 Fig.GC-78  Plots of log k Vs X1 for the development of Generalized correlation for systems B/T/-H-Dmso-W
 Fig.GC-79  Plots of log k Vs X2 for the development of Generalized correlation for systems B/T/-H-Dmso-W
 Fig.GC-80  Plots of log k Vs X3 for the development of Generalized correlation for systems B/T/-H-Dmso-W
 Fig.GC-81  Plots of log k Vs X4 for the development of Generalized correlation for systems B/T/-H-Dmso-W
 Fig.GC-82  Plots of log k Vs X5 for the development of Generalized correlation for systems B/T/-H-Dmso-W
 Fig.GC-83  Plots of log k Vs X1 for the development of Generalized correlation for systems B/T/X-H-Dmso-W
 Fig.GC-84  Plots of log k Vs X2 for the development of Generalized correlation for systems B/T/X-H-Dmso-W
 Fig.GC-85  Plots of log k Vs X3 for the development of Generalized correlation for systems B/T/X-H-Dmso-W
 Fig.GC-86  Plots of log k Vs X4 for the development of Generalized correlation for systems B/T/X-H-Dmso-W
 Fig.GC-87  Plots of log k Vs X5 for the development of Generalized correlation for systems B/T/X-H-Dmso-W
 Fig.GC-88  Plots of log k Vs X1 for the development of Generalized correlation for systems B/T/X-H-Dmso-W and B-Hep-Dmso-W
 Fig.GC-89  Plots of log k Vs X3 for the development of Generalized correlation for systems B/T/X-H-Dmso-W and B-Hep-Dmso-W
 Fig.GC-90  Plots of log k Vs X2 for the development of Generalized correlation for systems B/T/X-H-Dmso-W and B-Hep-Dmso-W
 Fig.GC-91  Plots of log k Vs X4 for the development of Generalized correlation for systems B/T/X-H-Dmso-W and B-Hep-Dmso-W
 Fig.GC-92  Plots of log k Vs X5 for the development of Generalized correlation for systems B/T/X-H-Dmso-W and B-Hep-Dmso-W
 Fig.GC-93  Plots of log k Vs X6 for the development of Generalized correlation for systems B/T/X-H-Dmso-W and B-Hep-Dmso-W
 Fig.GC-94  Plots of log k Vs X1 for the development of Generalized correlation for systems B/T/X-H-Dmso-W and B-Hep-Dmso-W and B-Oct-Dmso-W
Fig. GC-95: Plots of log k Vs X2 for the development of Generalized correlation for systems B/T/X-H-Dmso-W and B-Hep-Dmso-W and B-Oct-Dmso-W

Fig. GC-96: Plots of log k Vs X3 for the development of Generalized correlation for systems B/T/X-H-Dmso-W and B-Hep-Dmso-W and B-Oct-Dmso-W

Fig. GC-97: Plots of log k Vs X4 for the development of Generalized correlation for systems B/T/X-H-Dmso-W and B-Hep-Dmso-W and B-Oct-Dmso-W

Fig. GC-98: Plots of log k Vs X5 for the development of Generalized correlation for systems B/T/X-H-Dmso-W and B-Hep-Dmso-W and B-Oct-Dmso-W

Fig. GC-99: Plots of log k Vs X6 for the development of Generalized correlation for systems B/T/X-H-Dmso-W and B-Hep-Dmso-W and B-Oct-Dmso-W
Figure Index

Chapter-6: Results and Discussion for Liquid-Liquid Extraction of Aromatics in Packed Column

<table>
<thead>
<tr>
<th>Figure Number</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fig.1 (a)</td>
<td>The plot of % Hold up Vs. Vd with Vc as a parameter for the system: B-H-80%Dmf+20%W at 30 °C</td>
<td>569</td>
</tr>
<tr>
<td>Fig.1 (b)</td>
<td>The plot of % Hold up Vs. Vc with Vd as a parameter for the system: B-H-80%Dmf+20%W at 30 °C</td>
<td>569</td>
</tr>
<tr>
<td>Fig. 2 (a)</td>
<td>The plot of % Hold up Vs. Vd with Vc as a parameter for the system: B-H-80%Dmso+20%W at 40 °C</td>
<td>574</td>
</tr>
<tr>
<td>Fig. 2 (b)</td>
<td>The plot of % Hold up Vs. Vc with Vd as a parameter for the system: B-H-80%Dmso+20%W at 40 °C</td>
<td>574</td>
</tr>
<tr>
<td>Fig. 3</td>
<td>The plot of Vd + Vc(X/1-X) Vs. X(1-X) for the system: B-H-80%Dmf+20%W at 30 °C</td>
<td>579</td>
</tr>
<tr>
<td>Fig. 4</td>
<td>The plot of Vd + Vc(X/1-X) Vs. X(1-X) for the system B-H-80%Dmso-20%Water at 40 °C</td>
<td>579</td>
</tr>
<tr>
<td>Fig. 5</td>
<td>Comparison of plots of Vd+Vc(X/1-X) Vs. X(1-X) for Solvents-Dmf and Dmso.</td>
<td>582</td>
</tr>
<tr>
<td>Fig. 6</td>
<td>A Plot of limiting values of %AE Vs S/F ratio for systemB-H-80%Dmf-20%Wat30°C</td>
<td>585</td>
</tr>
<tr>
<td>Fig. 7</td>
<td>A Plot of limiting value of %AE Vs S/F ratio for system B-H-80%Dmso-20%Wat40°C</td>
<td>585</td>
</tr>
<tr>
<td>Fig. 8</td>
<td>The plot of % AE Vs. Vd with Vc as a parameter for the system: B-H-80%Dmf+20%W at 30 ° C</td>
<td>588</td>
</tr>
<tr>
<td>Fig. 9</td>
<td>The plot of % AE Vs. Vc with Vd as a parameter for the system B-H-80%Dmf+20%W at 30 ° C</td>
<td>588</td>
</tr>
<tr>
<td>Fig. 10</td>
<td>Effect of Vd on %AE with Vc as a parameter for system B-H-80%Dmso-20%W at 40 ° C</td>
<td>593</td>
</tr>
<tr>
<td>Fig. 11</td>
<td>Effect of Vc on %AE with Vd as parameter for system B-H-80%Dmso-20%W at 40 ° C</td>
<td>593</td>
</tr>
<tr>
<td>Fig. 12(a)</td>
<td>A plot of %AE VsΩ1 for solvent Dmf</td>
<td>596</td>
</tr>
<tr>
<td>Fig. 12 (b)</td>
<td>A plot of %AE VsΩ2 for solvent Dmf</td>
<td>596</td>
</tr>
<tr>
<td>Fig. 13 (a)</td>
<td>A plot of %AE VsΩ1 for solvent Dmso</td>
<td>601</td>
</tr>
<tr>
<td>Fig. 13(b)</td>
<td>A plot of %AE Vs.Ω2 for solvent Dmso</td>
<td>601</td>
</tr>
<tr>
<td>Fig. 14(a)</td>
<td>Comparison of plots %AE VsΩ1 for solvents Dmf and Dmso</td>
<td>603</td>
</tr>
</tbody>
</table>
Fig. 14(b) Comparison of plots $\%AE$ Vs $\theta_2$ for solvents Dmf and Dmso

Fig. 15-I Plot of $1/(H'B_1-H'B*)$ Vs. $H'B_1$ for determination of
Area under the curve for the system: B-H-(Dmf+W)

Fig. 15-II Plot of $1/(H'B_1-H'B*)$ Vs. $H'B_1$ for determination of
Area under the curve for the system: B-H-(Dmf+W)

Fig. 15-III Plot of $1/(H'B_1-H'B*)$ Vs. $H'B_1$ for determination of
Area under the curve for the system: B-H-(Dmf+W)

Fig. 15-IV Plot of $1/(H'B_1-H'B*)$ Vs. $H'B_1$ for determination of
Area under the curve for the system: B-H-(Dmf+W)

Fig. 15-V Plot of $1/(H'B_1-H'B*)$ Vs. $H'B_1$ for determination of
Area under the curve for the system: B-H-(Dmf+W)

Fig. 15-VI Plot of $1/(H'B_1-H'B*)$ Vs. $H'B_1$ for determination of
Area under the curve for the system: B-H-(Dmf+W)

Fig. 15-VII Plot of $1/(H'B_1-H'B*)$ Vs. $H'B_1$ for determination of
Area under the curve for the system: B-H-(Dmf+W)

Fig. 15-VIII Plot of $1/(H'B_1-H'B*)$ Vs. $H'B_1$ for determination of
Area under the curve for the system: B-H-(Dmf+W)

Fig. 16(a) The plot of $NIU_{od}$ Vs. $V_d$ with $V_c$ as a parameter
for the system: B-H-80% Dmf+20%W at 30° C

Fig. 16(b) The plot of $NTU_{oc}$ Vs. $V_c$ with $V_d$ as parameter
for the system: B-H-80% Dmf+20%W at 30° C

Fig. 17(a) Plot for effect of $V_d$ on $K_{od}$
with $V_c$ as parameter for system B-H-80% Dmf-20%W at 30 ° C

Fig. 17(b) Plot for effect of $V_c$ on $K_{oc}$
with $V_d$ as parameter for system B-H-80% Dmf-20%W at 30 ° C

Fig. 17(c) The plot of $(HTU)_{oc}$ Vs. $G_c/G_d$
system: B-H-80% Dmf-20%W at 30° C

Fig. 17(d) The plot of $(HTU)_{od}$ Vs. $G_d/G_c$
system: B-H-80% Dmf-20%W at 30° C

Fig. 17(e) Equilibrium Curve for B-H-80% Dmf-20%W at 30° C

Fig. 18(a) Plot of $K_{od}$ Vs. $V_d$ with $V_c$ as a parameter
System B-H-80% Dmf -20%W at 30 ° C

Fig. 18(b) Plot of $K_{oc}$ Vs. $V_c$ with $V_d$ as a parameter
System B-H-80% Dmf -20%W at 30 ° C

Fig. 19-I Plot of $1/(H'B_1-H'B*)$ Vs. $H'B_1$ for determination of
Area under the curve for the system: B-H-(Dmso+W)
Fig. 19-.II Plot of $1/(HB_1-HB^*)$ Vs. $HB_1$ for determination of
Area under the curve for the system: $B-H-(Dmso+W)$

Fig. 19-.III Plot of $1/(HB_1-HB^*)$ Vs. $HB_1$ for determination of
Area under the curve for the system: $B-H-(Dmso+W)$

Fig. 19-.IV Plot of $1/(HB_1-HB^*)$ Vs. $HB_1$ for determination of
Area under the curve for the system: $B-H-(Dmso+W)$

Fig. 19-.V Plot of $1/(HB^* - HB_1)$ Vs. $HB_1$ for determination of
Area under the curve.

Fig. 19-.VI ' Plot of $1/(HB^* - HB_1)$ Vs. $HB_1$ for determination of
Area under the curve for the system: $B-H-(Dmso+W)$

Fig. 19-.VII Plot of $1/(HB^* - HB_1)$ Vs. $HB_1$ for determination of
Area under the curve for the system: $B-H-(Dmso+W)$

Fig. 19-.VIII : Plot of $1/(HB^* - HB_1)$ Vs. $HB_1$ for determination of
Area under the curve for the system: $B-H-(Dmso+W)$

Fig. 20(a) The plot of $NTU_{od}$ Vs $V_d$ with $V_c$ as parameter for the
system: $B-H-80\%Dmso-20\%W$ at $40 \, ^\circ C$

Fig. 20(b) The plot of $NTU_{oc}$ Vs $V_c$ with $V_d$ as parameter for the
system: $B-H-80\%Dmso-20\%W$ at $40 \, ^\circ C$

Fig. 21(a) The plot of $HTU_{od}$ Vs $V_d$ with $V_c$ as parameter for the
system: $B-H-80\%Dmso-20\%W$ at $40 \, ^\circ C$

Fig. 21(b) The plot of $HTU_{oc}$ Vs $V_c$ with $V_d$ as parameter for the
system: $B-H-80\%Dmso-20\%W$ at $40 \, ^\circ C$

Fig. 21© Plot of $(HTU)_{oc}$ Vs $G_c/G_d$ for
system: $B-H-80\%Dmso-20\%W$ at $40 \, ^\circ C$

Fig. 21(d) Plot of $(HTU)_{od}$ Vs $G_c/G_d$
system: $B-H-80\%Dmso-20\%W$ at $40 \, ^\circ C$

Fig. 21(e) Equilibrium Curve for
System: $B-H-80\%Dmso+20\%W$ at $40 \, ^\circ C$

Fig. 22(a) Plot for effect of $V_d$ on $K_{od}xa$ with $V_c$ as parameter for
system: $B-H-80\%Dmso-20\%W$ at $40 \, ^\circ C$

Fig. 22(b) Plot for effect of $V_c$ on $K_{oc}xa$ with $V_d$ as parameter for
system: $B-H-80\%Dmso-20\%W$ at $40 \, ^\circ C$