<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Properties of Zirconium</td>
<td>4</td>
</tr>
<tr>
<td>3.1</td>
<td>Effect of equilibration time on extraction of 0.001 M Zr (IV) from 5M HCl using 0.1 M TOA in kerosene.</td>
<td>44</td>
</tr>
<tr>
<td>3.2</td>
<td>Effect of HCl concentration on extraction of 0.001M Zr (IV) using 0.1 M TOA in kerosene.</td>
<td>46</td>
</tr>
<tr>
<td>3.3</td>
<td>Effect of extractant concentration on extraction of 0.001 M Zr (IV) from 5 M HCl.</td>
<td>47</td>
</tr>
<tr>
<td>3.4</td>
<td>Effect of chloride ion concentration on extraction of 0.001 M Zr (IV) from 5 M HCl using 0.1M TOA.</td>
<td>49</td>
</tr>
<tr>
<td>3.5</td>
<td>Effect of temperature on extraction of 0.001 M Zr (IV) from 4M HCl using 0.1M TOA in kerosene.</td>
<td>50</td>
</tr>
<tr>
<td>3.6</td>
<td>Effect of metal ion concentration on extraction of 0.001 M Zr (IV) from 4M HCl using 0.1 M TOA in kerosene.</td>
<td>51</td>
</tr>
<tr>
<td>3.7</td>
<td>Effect of diluents on the extraction of Zr(IV ) from 4M and 5M HCl using 0.1M TOA.</td>
<td>53</td>
</tr>
<tr>
<td>4.1</td>
<td>Effect of HCl concentration on extraction of 0.001M Zr (IV) using 0.01 M Cyanex 921 and 0.01M Cyanex 923 in kerosene.</td>
<td>56</td>
</tr>
<tr>
<td>4.2</td>
<td>Effect of extractant concentration on extraction of 0.001M Zr (IV) using 0.01 M Cyanex 921 and 0.01 M Cyanex 923 in kerosene.</td>
<td>58</td>
</tr>
<tr>
<td>4.3</td>
<td>Effect of chloride ion concentration on extraction of 0.001 M Zr (IV) from 5 M HCl using 0.01M Cyanex 921.</td>
<td>60</td>
</tr>
<tr>
<td>4.4</td>
<td>Effect of chloride ion concentration on extraction of 0.001 M Zr (IV) from 4 M HCl using 0.01M Cyanex 923.</td>
<td>61</td>
</tr>
</tbody>
</table>
4.5 Effect of temperature on extraction of 0.001 M Zr (IV) from 4M HCl using 0.01M Cyanex 921 and 0.01M Cyanex 923 in kerosene.

4.6 Effect of Zirconium (IV) concentration on extraction of 0.001 M Zr (IV) from 4M HCl using 0.01 M Cyanex 921 and 0.01 M Cyanex 923 in kerosene.

4.7 Effect of diluents on the extraction of Zr(IV) from 4M and 5M HCl using 0.01M Cyanex 921.

4.8 Effect of diluents on the extraction of Zr(IV) from 4M and 5M HCl using 0.01M Cyanex 923.

4.9 Stripping of Zr (IV) from loaded organic phase HNO3 and Na2CO3 as strippants.

5.1 Effect of HCl concentration on extraction of 0.001M Zr (IV) using 0.1 M TOA and 0.01M Cyanex 921 /0.02M Cyanex 921 in kerosene.

5.2 Effect of acid concentration on the extraction of 0.001M Zr (IV) by using 0.1M TOA (D1), 0.01M Cyanex 921 (D2) and their binary mixture (Dmix).

5.3 Effect of extractant concentration on extraction of 0.001M Zr (IV) from 5M and 6M HCl at fixed Cyanex 921(0.01M) in the presence of varying concentration of TOA in kerosene.

5.4 Effect of extractant concentration on extraction of 0.001M Zr (IV) from 5M and 6M HCl at fixed TOA (0.1M) in the presence of varying concentration of Cyanex 921 in kerosene.

5.5 Effect of chloride ion concentration on extraction of 0.001 M Zr (IV) from 5 M HCl using 0.1M TOA and 0.01M Cyanex 921.

5.6 Effect of temperature on extraction of 0.001 M Zr (IV) from 4M HCl and 5M HCl using binary mixture of 0.1M TOA and 0.01M Cyanex 921 in kerosene.
5.7 Effect of metal ion concentration on extraction of 0.001M Zr (IV) from 4M HCl using 0.1M TOA and 0.01 M Cyanex 921 in kerosene.

5.8 Effect of diluents on the extraction of Zr (IV) from 4M and 5M HCl using binary mixture of 0.1M TOA and 0.01M Cyanex 921.

5.9 Effect of diluents on the extraction of 0.001M Zr (IV) from 5M HCl by 0.1M TOA (D₁), 0.01M Cyanex 921 (D₂) and their binary mixture (D₃max).

5.10 Stripping of Zr (IV) from the loaded organic phase of 0.1M TOA and 0.02M Cyanex 921 in kerosene.

6.1 Effect of HCl concentration on extraction of 0.001M Zr (IV) using 0.1 M TOA and 0.01M Cyanex 923 in kerosene.

6.2 Effect of acid concentration on the extraction of 0.001M Zr (IV) using 0.1M TOA (D₁), 0.01M Cyanex 923 (D₂) and their binary mixture (D₃max).

6.3 Effect of extractant concentration on extraction of 0.001M Zr (IV) from 4M and 5M HCl at fixed Cyanex 923(0.01M) in the presence of varying concentration of TOA in kerosene.

6.4 Effect of extractant concentration on extraction of 0.001M Zr (IV) from 4M at fixed Cyanex 923(0.008M) in the presence of varying concentration of TOA in kerosene.

6.5 Effect of extractant concentration on extraction of 0.001M Zr (IV) from 4M HCl at fixed TOA (0.1M) in the presence of varying concentration of Cyanex 923 in kerosene.

6.6 Effect of chloride ion concentration on extraction of 0.001 M Zr (IV) from 4 M HCl using 0.1M TOA and 0.01M Cyanex 923.

6.7 Effect of temperature on extraction of 0.001 M Zr (IV) from 4M HCl using binary mixture of 0.1M TOA and 0.01M Cyanex 923 in kerosene.

6.8 Effect of metal ion concentration on extraction of 0.001M Zr (IV) from 4M HCl using 0.1M TOA and 0.01 M Cyanex 923 in kerosene.
6.9 Effect of diluents on the extraction of 0.001M Zr(IV) from 4M HCl with mixture of 0.1M TOA and 0.01M Cyanex923 in kerosene.

6.10 Effect of diluents on the extraction of 0.001M Zr (IV) from 4M HCl by 0.1M TOA (D₁), 0.01M Cyanex 923 (D₂) and their binary mixture (Dₘₐₓ).

6.11 Stripping of Zr (IV) from loaded organic phase containing mixture of 0.1M TOA and 0.01M Cyanex 923.

7.1 Effect of [FeCl₃] concentration on extraction of 0.001M Zr (IV) using 0.1 M TOA, 0.01M Cyanex 921 and their mixture in kerosene.

7.2 Effect of [FeCl₃] concentration on extraction of 0.001M Zr (IV) using 0.1 M TOA, 0.01M Cyanex 923 and their mixture in kerosene.

7.3 Values of distribution ratios (D) and Separation factor (β) of Zr(IV) and Fe(III) with 4M HCl.

7.4 Effect of [AlCl₃] concentration on extraction of 0.001M Zr (IV) using 0.1 M TOA, 0.01M Cyanex 921 and their mixture in kerosene.

7.5 Effect of [AlCl₃] concentration on extraction of 0.001M Zr (IV) using 0.1 M TOA, 0.01M Cyanex 923 and their mixture in kerosene.

7.6 Values of distribution ratios (D) and Separation factor (β) of Zr(IV) and Al(III) with 4M HCl.

7.7 Percent stripping of the extracted Zr(IV) in presence of Fe(III) with 4M HCl from loaded organic phase.

7.8 Percent stripping of the extracted Zr(IV) in presence of Al(III) with 4M HCl from loaded organic phase.

7.9 Percent stripping of the extracted Fe(III) in presence of Zr(IV) with 4M HCl from loaded organic phase.

7.10 Percent stripping of the extracted Al(III) in presence of Zr(IV) with 4M HCl from loaded organic phase.

(xv)