

## LIST OF FIGURES

	<b>Page</b>
<b>Figure 2.1:</b> Schematic view of ion diffusion paths (Ono, 2007)	<b>7</b>
<b>Figure 2.2:</b> Ag <sub>6</sub> I <sub>10</sub> model cluster (Kowada, 2000)	<b>8</b>
<b>Figure 2.3:</b> Isosurface of Cu ion at (a) tetrahedral site and (b) octahedral site (Aniya, 2005)	<b>9</b>
<b>Figure 2.4:</b> The schematic complex ion model [CuI <sub>8</sub> ] <sup>7-</sup> (Ida, 2002)	<b>10</b>
<b>Figure 2.5:</b> Variation of log (σT) with inverse of temperature (1/T) for the different samples of the system 35( )-32.5 -32.5, where 0.05 ≤ x ≤ 0.25 (Murugesan, 2002)	<b>13</b>
<b>Figure 2.6:</b> Plot of temperature dependence of the d.c conductivity for the Ag <sub>1-x</sub> Cu <sub>x</sub> I solid solutions along with pure AgI. (Kumar et. al., 2003)	<b>14</b>
<b>Figure 2.7:</b> Plots of conductivity of Ag-rich solid solution (Kumar, 2006).	<b>15</b>
<b>Figure 2.8:</b> X-ray powder diffraction pattern for the Ag Cu I solid for various compositions (Kumar, 2002).	<b>18</b>
<b>Figure 2.9:</b> Powder XRD patterns a various temperatures for the Ag-rich Ag <sub>0.95</sub> Cu <sub>0.05</sub> I solid solution. (Kumar, 2006).	<b>19</b>
<b>Figure 2.10:</b> X-ray diffractograms of AgI-CuI solid solutions (Mohan, 2004).	<b>20</b>
<b>Figure 2.11:</b> X-ray diffraction pattern of AgI-CuI based solid solutions recorded at room temperature (Mohan 2002).	<b>22</b>
<b>Figure 4.1:</b> Complex impedance plot of pure AgI at room temperature.	<b>32</b>
<b>Figure 4.2:</b> Complex impedance plot of 0.1 CuI-0.9AgI at room temperature.	<b>33</b>
<b>Figure 4.3:</b> Complex impedance plot of 0.2CuI-0.8AgI at room temperature.	<b>33</b>
<b>Figure 4.4:</b> Complex impedance plot of 0.3 CuI-0.7AgI at room Temperature	<b>34</b>
<b>Figure 4.5:</b> Complex impedance plot of 0.4 CuI-0.6 AgI at room temperature.	<b>34</b>

<b>Figure 4.6:</b>	Plot of conductivity at room temperature	<b>37</b>
<b>Figure 4.7:</b>	Plots of frequency dependent of conductivity at several temperatures for pure AgI.	<b>38</b>
<b>Figure 4.8:</b>	Plots of frequency dependent of conductivity at several temperatures for 0.1CuI-0.9AgI.	<b>41</b>
<b>Figure 4.9:</b>	Plots of frequency dependent of conductivity at several temperatures for 0.2CuI-0.8AgI.	<b>43</b>
<b>Figure 4.10:</b>	Plots of frequency dependent of conductivity at several temperatures for 0.3CuI-0.7AgI.	<b>45</b>
<b>Figure 4.11:</b>	Plots of frequency dependent of conductivity at several temperatures for 0.4CuI-0.6AgI.	<b>47</b>
<b>Figure 4.12:</b>	Temperature dependence of ionic conductivity for pure AgI.	<b>49</b>
<b>Figure 4.13:</b>	Temperature dependence of ionic conductivity for 0.1CuI-0.9AgI.	<b>49</b>
<b>Figure 4.14:</b>	Temperature dependence of ionic conductivity for 0.2CuI-0.8AgI.	<b>50</b>
<b>Figure 4.15:</b>	Temperature dependence of ionic conductivity for 0.3CuI-0.7AgI.	<b>50</b>
<b>Figure 4.16:</b>	Temperature dependence of ionic conductivity for 0.4CuI-0.6AgI.	<b>51</b>
<b>Figure 5.1:</b>	Real part of complex permittivity with frequency for AgI-CuI mixture.	<b>54</b>
<b>Figure 5.2:</b>	Imaginary part of complex permittivity with frequency for AgI-CuI mixture.	<b>54</b>
<b>Figure 5.3:</b>	Plots of real part of complex permittivity with frequency at several temperatures for pure AgI.	<b>55</b>
<b>Figure 5.4:</b>	Plots of real part of complex permittivity with frequency at several temperatures for 0.1CuI-0.9AgI.	<b>57</b>
<b>Figure 5.5:</b>	Plots of real part of complex permittivity with frequency at several temperatures for 0.2CuI-0.8AgI.	<b>59</b>
<b>Figure 5.6:</b>	Plots of real part of complex permittivity with frequency at several temperatures for 0.3CuI-0.7AgI.	<b>61</b>

<b>Figure 5.7:</b>	Plots of real part of complex permittivity with frequency at several temperatures for 0.4CuI-0.6AgI.	<b>63</b>
<b>Figure 5.8:</b>	Plots of imaginary part of complex permittivity with frequency at several temperatures for pure AgI	<b>65</b>
<b>Figure 5.9:</b>	Plots of imaginary part of complex permittivity with frequency at several temperatures for 0.1CuI-0.9AgI.	<b>67</b>
<b>Figure 5.10:</b>	Plots of imaginary part of complex permittivity with frequency at several temperatures for 0.2CuI-0.8AgI.	<b>69</b>
<b>Figure 5.11:</b>	Plots of imaginary part of complex permittivity with frequency at several temperatures for 0.3CuI-0.7AgI.	<b>71</b>
<b>Figure 5.12:</b>	Plots of imaginary part of complex permittivity with frequency at several temperatures for 0.4CuI-0.6AgI.	<b>73</b>
<b>Figure 5.13:</b>	$\ln \varepsilon_i$ versus $\ln \omega$ (Hz) at various temperatures for pure AgI.	<b>77</b>
<b>Figure 5.14:</b>	$\ln \varepsilon_i$ versus $\ln \omega$ (Hz) at various temperatures for 0.1CuI-0.9AgI.	<b>79</b>
<b>Figure 5.15:</b>	$\ln \varepsilon_i$ versus $\ln \omega$ (Hz) at various temperatures for 0.2CuI-0.8AgI.	<b>81</b>
<b>Figure 5.16:</b>	$\ln \varepsilon_i$ versus $\ln \omega$ (Hz) at various temperatures for 0.3CuI-0.7AgI.	<b>83</b>
<b>Figure 5.17:</b>	$\ln \varepsilon_i$ versus $\ln \omega$ (Hz) at 423 K for 0.4CuI-0.6AgI.	<b>85</b>
<b>Figure 5.18:</b>	$\sigma$ versus T (K) for pure AgI.	<b>88</b>
<b>Figure 5.19:</b>	$\sigma$ versus T (K) for 0.1CuI-0.9AgI.	<b>88</b>
<b>Figure 5.20:</b>	$\sigma$ versus T (K) for 0.2CuI-0.8AgI.	<b>88</b>
<b>Figure 5.21:</b>	$\sigma$ versus T (K) for 0.3CuI-0.7AgI.	<b>89</b>
<b>Figure 5.22:</b>	$\sigma$ versus T (K) for 0.4CuI-0.6AgI.	<b>89</b>
<b>Figure 5.23:</b>	Plots of variation of real ( $M_r$ ) modulus constant as a function of frequency for AgI-CuI at different compositions.	<b>91</b>

---

<b>Figure 5.24:</b>	Plots of variation of imaginary ( $M_i$ ) modulus constant as a function of frequency for AgI-CuI at different compositions.	<b>91</b>
<b>Figure 5.25:</b>	Plots of real part of modulus with frequency at several temperatures for pure AgI.	<b>93</b>
<b>Figure 5.26:</b>	Plots of real part of modulus with frequency at several temperatures for 0.1CuI-0.9AgI.	<b>95</b>
<b>Figure 5.27:</b>	Plots of real part of modulus with frequency at several temperatures for 0.2CuI-0.8AgI.	<b>97</b>
<b>Figure 5.28:</b>	Plots of real part of modulus with frequency at several temperatures for 0.3CuI-0.7AgI.	<b>99</b>
<b>Figure 5.29:</b>	Plots of real part of modulus with frequency at several temperatures for 0.4CuI-0.6AgI.	<b>101</b>
<b>Figure 5.30:</b>	Plots of imaginary part of modulus with frequency at several temperatures for pure AgI.	<b>103</b>
<b>Figure 5.31:</b>	Plots of imaginary part of modulus with frequency at several temperatures for 0.1CuI-0.9AgI.	<b>105</b>
<b>Figure 5.32:</b>	Plots of imaginary part of modulus with frequency at several temperatures for 0.2CuI-0.8AgI.	<b>107</b>
<b>Figure 5.33:</b>	Plots of imaginary part of modulus with frequency at several temperatures for 0.3CuI-0.7AgI.	<b>109</b>
<b>Figure 5.34:</b>	Plots of imaginary part of modulus with frequency at several temperatures for 0.4CuI-0.6AgI.	<b>111</b>
<b>Figure 5.35:</b>	Normalized modulus $M_i$ spectra for highest conducting sample in the AgI-CuI mixture at different temperatures.	<b>113</b>
<b>Figure 6.1:</b>	X-ray diffraction pattern of pure AgI.	<b>116</b>
<b>Figure 6.2:</b>	X-ray diffraction pattern of 0.1CuI-0.9AgI.	<b>116</b>
<b>Figure 6.3:</b>	X-ray diffraction pattern of 0.2CuI-0.8AgI.	<b>117</b>
<b>Figure 6.4:</b>	X-ray diffraction pattern of 0.3CuI-0.7AgI.	<b>117</b>
<b>Figure 6.5:</b>	X-ray diffraction pattern of 0.4CuI-0.6AgI.	<b>118</b>
<b>Figure 6.6:</b>	Plot of $D \cos \theta$ versus $4 \sin \theta$ for AgI.	<b>120</b>
<b>Figure 6.7:</b>	Plot of $D \cos \theta$ versus $4 \sin \theta$ for 0.1CuI-0.9AgI.	<b>121</b>

---

List of Figures

<b>Figure 6.8:</b>	Plot of $D \cos \theta$ versus $4 \sin \theta$ for 0.2CuI-0.8AgI	<b>121</b>
<b>Figure 6.9:</b>	Plot of $D \cos \theta$ versus $4 \sin \theta$ for 0.3CuI-0.7AgI.	<b>122</b>
<b>Figure 6.10:</b>	Plot of $D \cos \theta$ versus $4 \sin \theta$ for 0.4CuI-0.6AgI.	<b>122</b>
<b>Figure 6.11:</b>	Crystallite size of the binary system with various wt % of CuI.	<b>123</b>