Fig. 5.1 (a): XRD patterns of Co$_{1-x}$Zn$_x$Fe$_2$O$_4$ for $x = 0.0$ and 0.2
Fig. 5.1 (b): XRD patterns of Co$_{1-x}$Zn$_x$Fe$_2$O$_4$ for $x = 0.4$ and 0.6
Fig. 5.1(c): XRD patterns of Co$_{1-x}$Zn$_x$Fe$_2$O$_4$ for x = 0.8 and 1.0
Fig. 5.2: Variation of lattice constant $a$ and $a_{th}$ with composition for $Co_{1-x}Zn_xFe_2O_4$.
Fig. 5.3: Variation of X-ray density with composition for Co$_{1-x}$Zn$_x$Fe$_2$O$_4$
Fig. 5.4: Variation of particle size with composition for $\text{Co}_{1-x}\text{Zn}_x\text{Fe}_2\text{O}_4$
Fig. 5.5: Variation of hopping length ($L_A$) and ($L_B$) with composition for $\text{Co}_{1-x}\text{Zn}_x\text{Fe}_2\text{O}_4$
Fig. 5.6: Variation of ionic radius (r_A and r_B) with composition for Co_{1-x}Zn_xFe_2O_4
Fig. 5.7 (a): Variation of log $\rho$ with $1000/T$ of $\text{Co}_{1-x}\text{Zn}_x\text{Fe}_2\text{O}_4$ for $x = 0.0$ and $x = 0.2$
Fig. 5.7 (b): Variation of $\log \rho$ with $1000/T$ of $\text{Co}_{1-x}\text{Zn}_x\text{Fe}_2\text{O}_4$ for $x = 0.4$ and $x = 0.6$
Fig. 5.7 (c): Variation of log $\rho$ with $1000/T$ of $\text{Co}_{1-x}\text{Zn}_x\text{Fe}_2\text{O}_4$ for $x = 0.8$
Fig. 5.8: Variation of Curie temperature with composition of the system $\text{Co}_{1-x}\text{Zn}_x\text{Fe}_2\text{O}_4$
Fig. 5.9 (a): Variation of a.c. susceptibility with temperature of $\text{Co}_{1-x}\text{Zn}_x\text{Fe}_2\text{O}_4$ for $x = 0.0$ and $0.2$
Fig. 5.9(b): Variation of a.c. susceptibility with temperature of $\text{Co}_{1-x}\text{Zn}_x\text{Fe}_2\text{O}_4$ for $x = 0.4$ and $0.6$. 

**Figure Caption:**

- **Co$_{1-x}$Zn$_x$Fe$_2$O$_4$ for $x = 0.4$ and 0.6**

**Graph Details:**
- Two graphs showing the variation of $\chi_T/\chi_{RT}$ with temperature (K) for $x = 0.4$ and $0.6$.
- The graphs compare the susceptibility before and after a certain condition.
- The data points are marked with red and black squares, indicating before and after measurements, respectively.

**Graph Labels:**
- $\chi_T/\chi_{RT}$ on the y-axis.
- Temperature (K) on the x-axis.
Fig. 5.9 (c): Variation of a.c. susceptibility with temperature of Co_{1-x}Zn_xFe_2O_4 for x = 0.8
Fig. 5.10 (a): Variation of log D with 1000/T of Co$_{1-x}$Zn$_x$Fe$_2$O$_4$ for $x = 0.0$ and $x = 0.2$
Fig. 5.10 (b): Variation of log D with 1000/T of \( \text{Co}_{1-x}\text{Zn}_x\text{Fe}_2\text{O}_4 \) for \( x = 0.4 \) and \( x = 0.6 \)
Fig. 5.10 (c): Variation of log D with 1000/T of Co$_{1-x}$Zn$_x$Fe$_2$O$_4$ for x = 0.8.
Fig. 5.7: Variation of observed and calculated magnetic moment with composition for \( \text{Co}_{1-x}\text{Zn}_{x}\text{Fe}_2\text{O}_4 \)