

List of Figures

Fig. 2.1. Zincblende. The arrangement of metal atoms (small filled circles) and non-metal atoms (large-open circles) in Zincblende, the cubic form of Zns

Fig. 2.2. Wurtzite. The arrangement of metal atoms (small filled circles) and non-metal atoms (large-open circles) in wurtzite, the hexagonal form of Zns.

Fig. 2.3. Covalent Sulphur molecular solid at room temperature with the formula S₈

Fig. 2.4. Structure of Zinc crystal.

Fig. 2.5 Techniques used to Synthesis one-dimensional nanwires

Fig. 2.6 Schematic of tube furnace for vapor– liquid-solid growth.

Fig. 2.7 The schematic diagram of traditional adsorption-induced VLS model : (a) masstransport of vapor species, (b) intermediate reaction at the vapor–liquid interface, (c)penetration of the product to the melt and subsequent diffusion to the liquid–solid interface, and(d) incorporation into the solid at the liquid–solid interface and growth

Fig. 2.8 Schematics for a laser ablation nanowire growth apparatus.

Fig. 2.9 Schematic of tube furnace for vapor-solid growth .

Fig. 2.10 Schematics description of the oxide assisted Si nanowire growth process and Experimental set-up for oxide assisted method.

Fig. 2.11 Schematics showing the growth of nanowire through the solution-liquid-solid mechanism.

Figure 2.12 (a) Excited e and ground stat (g)energy levels showing absorption and emission for the process of fluorescence. (b) metastable level (m) giving rise to a delay between excitation and emission during the process of phosphorescence.

Figure 2.13 Schematic band model for thermoluminescence

Figure 2.14. TL intensity Vs annealing temperature.

Fig. 2.15 Schematics diagram of Transmission electron microscopy

Fig. 2.16 Schematics diagram for Switching TEM between diffraction mode and image mode

Fig. 2.17 Schematics diagram of a scanning electron microscope.

Fig 2.18 Electron dispersive x-ray spectrometer detector

Fig 2.19 EDS pattern obtained from ZnS nanowires sample.

Fig 2.20 Schematic of Bragg spectrometer

Fig 2.21 XRD pattern of synthesized ZnS nanowires on a Si substrate

Fig. 3.1 Schematics showing the synthesis of ZnS nanoparticels by vapor transport deposition method

Figure 4.1SEM image of commercial ZnS powder

Figure 4.2 SEM image of ZnS nano crystal

Figure 4.3 EDX of ZnS nano particles

Figure 4.4 EDX of ZnS powder

Figure 4.5. XRD patterns of ZnS powder (top) and ZnS:Mn nano particles (bottom)

Figure .5.1 TL glow curve of commercial ZnS powder

Figure 5.2 TL glow curve of ZnS nano particles

Figure 5.3 TL intensity vs absorb dose of ZnS commercial powder

Figure 5.4 TL intensity vs absorb dose of ZnS nanophoshor without manganese

Figure 5.3 TL intensity vs absorb dose of ZnS nanophoshor

doped with 1mol of manganese sulfate

Figure 5.6 TL intensity vs absorb dose of ZnS nanophoshor

doped with 2mol of manganese sulfate

Figure 5.7 TL intensity vs absorb dose of ZnS nanophoshor

doped with 3mol of manganese sulfate

Figure 5.8 TL intensity vs absorb dose of ZnS doped with different Mn concentrations

Figure 5.9 TL intensity vs fading time (hour) of ZnS commercial powder

Figure 5.10 TL intensity vs fading time (day) of ZnS commercial powder

Figure 5.11 TL intensity vs fading time (hour) of ZnS nanophoshor without manganese

Figure 5.12 TL intensity vs fading time (day) of ZnS nanophoshor without manganese

Figure 5.13 TL intensity vs fading time (hour) of ZnS nanophoshor doped with 1mol of manganese sulfate

Figure 5.14 TL intensity vs fading time (day) of ZnS nanophoshor doped with 1mol of manganese sulfate

Figure 5.15 TL intensity vs fading time (hour) of ZnS nanophoshor doped with 2mol of manganese sulfate

Figure 5.16 TL intensity vs fading time (day) of ZnS nanophoshor doped with 2mol of manganese sulfate

Figure 5.17 TL intensity vs fading time (hour) of ZnS nanophoshor doped with 3mol of manganese sulfate

Figure 5.18 TL intensity vs fading time (day) of ZnS nanophoshor doped with 3mol of manganese sulfate

Figure 5.19 TL intensity vs fading time (hour) of ZnS nanophoshor doped with different Mn concentrations

Figure 5.20 TL intensity vs fading time (day) of ZnS nanophoshor doped with different Mn concentrations

Figure 5.21 glow curve of ZnS:Mn nanoparticals made by vapor transport deposition method

Figure 5.22 glow curve of ZnS:Mn powder remains in quartz tube

Figure 5.23 thermoluminescence glow curve of ZnS:Mn nano particles groups

Figure 5.24 Absorb dose Vs Average corrected value

List of Tables

Table 1.1 the classification of nano materials dimensions.

Table 2.1 the types of bonds and there position in the periodic table

Table 5.1. ^{60}Co dose rate

Table 5.2 exposure time, dose rate, absorb dose and TL intensity of ZnS commercial powder

Table 5.3 exposure time, dose rate , absorb dose and TL intensity of ZnS nanophoshor without manganese

Table 5.4 exposure time, dose rate , absorb dose and TL intensity of ZnS nanophoshor doped with 1mol of manganese sulfate

Table 5.5 exposure time, dose rate , absorb dose and TL intensity of ZnS nanophoshor doped with 2mol of manganese sulfate

Table 5.6 exposure time, dose rate , absorb dose and TL intensity of ZnS nanophoshor doped with 3mol of manganese sulfate

Table 5.7 exposure time, dose rate , absorb dose and TL intensity of ZnS doped with different Mn concentrations

Table 5.8 exposure time, dose rate , absorb dose , fading and TL intensity of ZnS commercial powder

Table 5.9 exposure time, dose rate , absorb dose , fading and TL intensity of ZnS nanophoshor without manganese

Table 5.10 exposure time, dose rate , absorb dose , fading and TL intensity of ZnS nanophoshor doped with 1mol of manganese sulfate

Table 5.11 exposure time, dose rate , absorb dose , fading and TL intensity of ZnS nanophoshor doped with 2mol of manganese sulfate

Table 5.12 exposure time, dose rate , absorb dose , fading and TL intensity of ZnS nanophoshor doped with 3mol of manganese sulfate

Table 5.13 exposure time, dose rate , absorb dose , fading and TL intensity of ZnS doped with different Mn concentrations

Table 5.14 element correction coefficient (ECC) and corrected value for ZnS: Mn dosimeter

Table 5.15 Absorb dose and Average corrected value.