CHAPTER 4

Characterization

4.1 ZnS powder and ZnS nano particles (SEM image)

The morphology and chemical composition of ZnS:Mn particles synthesized by chemical precipitation were characterized by high resolution scanning electron microscopy FESEM, XRD and EDX . (Fig. 4.1) and (Fig.4.2) shows FESME image of commercial ZnS powder and ZnS nano particles respectively.

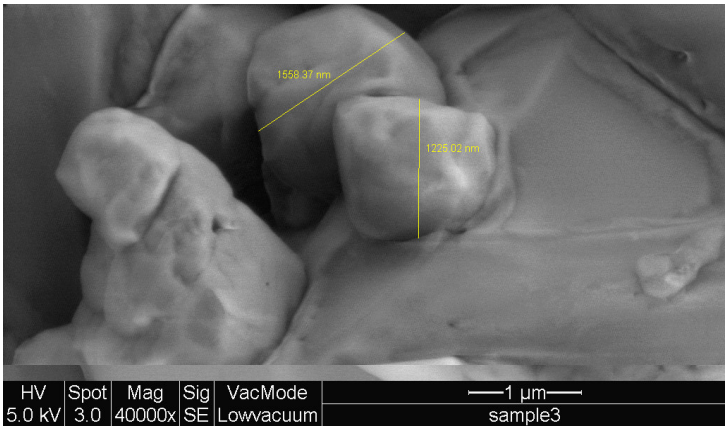

Figure 4.1 SEM image of commercial ZnS powder

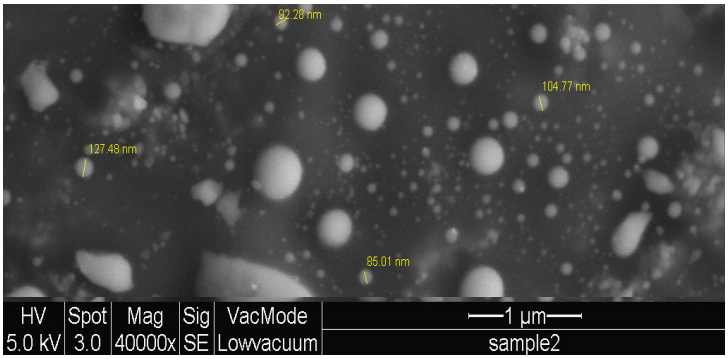

Figure 4.2 SEM image of ZnS nano crystal

It can be seen that the obtained products consist of particles with the dimension about 85–150nm, Compared with the size of ZnS commercial particles which have dimension of order of microns.

4.2 EDX spectra of ZnS powder and ZnS nano particles

The EDX spectra indicate that the particles were composed of Zn, S, and Mn as shown in Fig.4.3. and Fig 4.4.

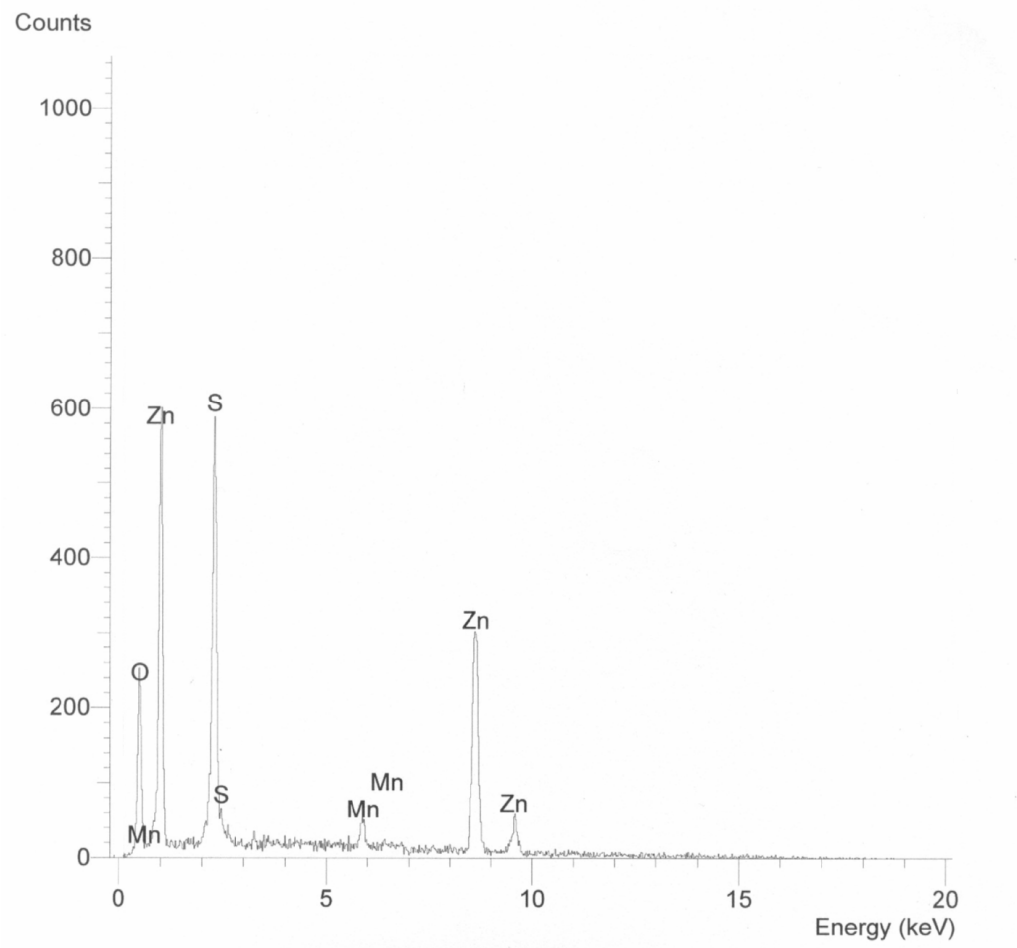

Figure 4. 3 EDX of ZnS nano particles

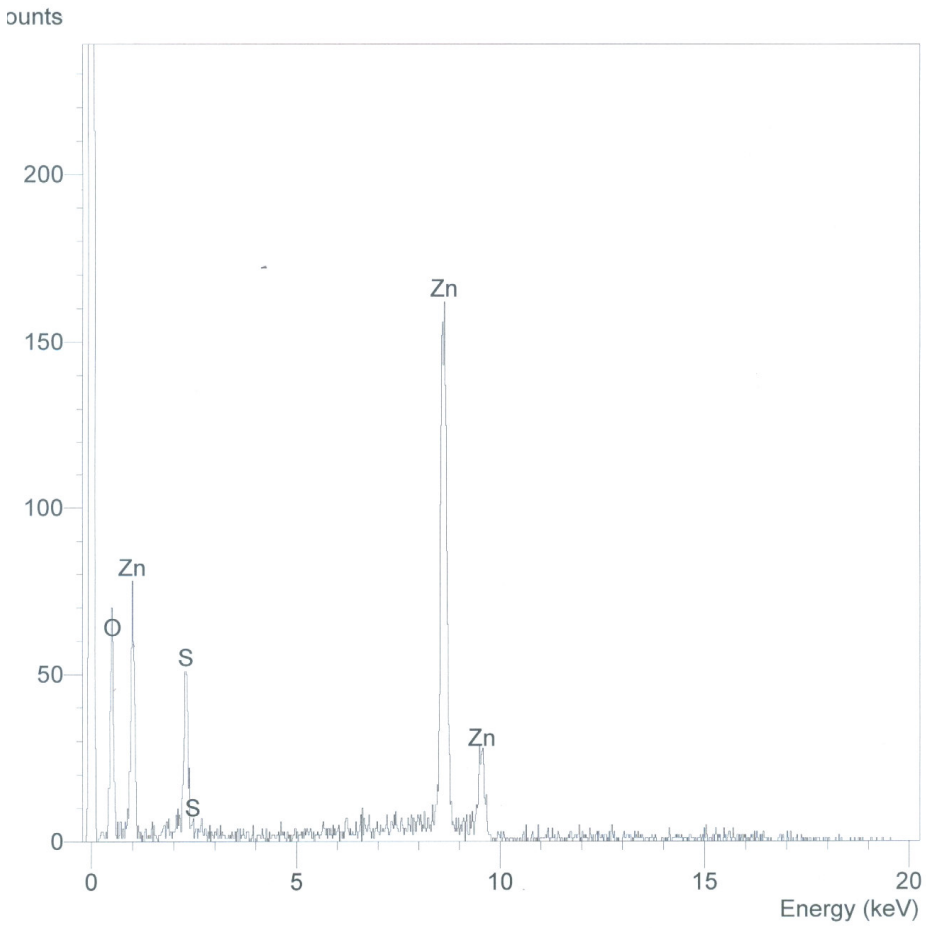

Figure 4.4 EDX of ZnS commercial powder

By comparing the compounds of commercial ZnS and ZnS nano particles, it can be seen that in the two samples the oxygen is existed.

4.3 XRD patterns of ZnS powder and ZnS nano particles

Fig.4.5 shows XRD patterns of a commercial ZnS powder and the ZnS: Mn nano particles. The peaks are observed at 2θ values of 26.3◦, 46.2◦, and 56.9◦, which correspond to the (111), (220), and (331) planes of cubic ZnS, respectively.

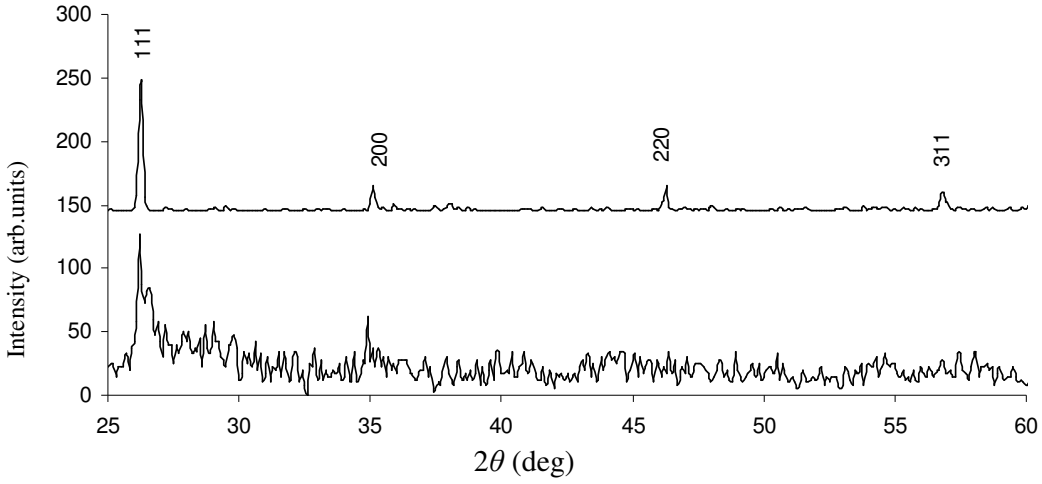

Figure 4.5. XRD patterns of ZnS powder (top) and ZnS:Mn nano particles (bottom)