Fig. S1 Home-made ultrasonic spray pyrolysis system used for the deposition of $ZnS:Eu^{2+}$ and ZnS thin films.

Fig. S2 AFM micrographs images of the $ZnS:Eu^{2+}$ film with different zooms. It is observe that the hexagonal agglomerates are composed of smaller grains.

Fig. S3 Screen captures of the Winspm Processing program from Jeol, showing the size of the grains evaluated in different zones of the $ZnS:Eu^{2+}$ film. The size is given by the length pointed by arrows

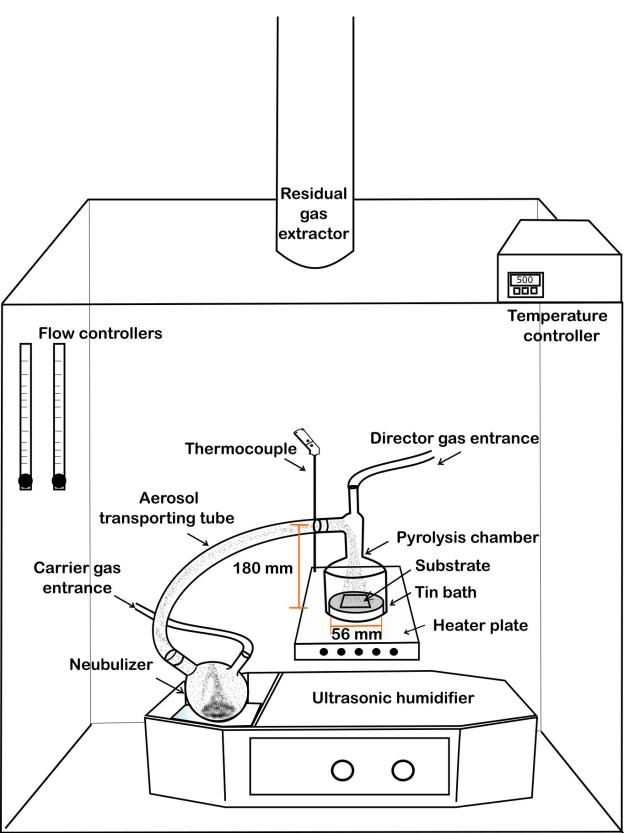
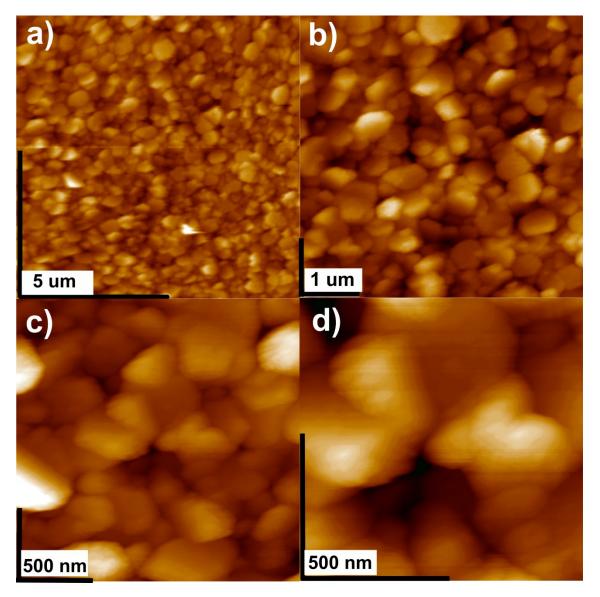
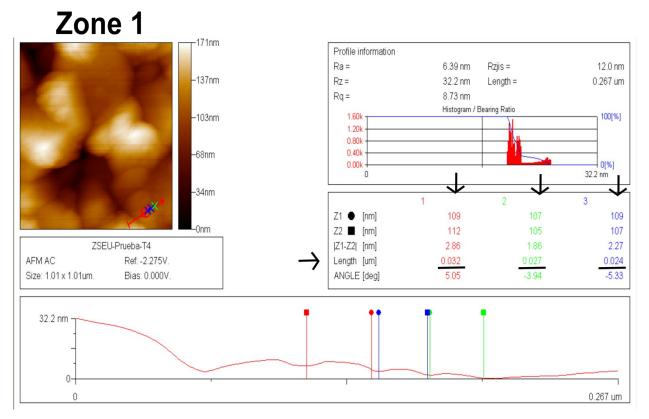


Fig. S2







Zone 2

