PbS NANO PARTICLES FROM NONAQUEOUS SOLUTION

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Nano particles of PbS have great potential for photonics since it has a large effective Bohr radius (18 nm) arising from high dielectric constant (17.3) and small effective electron mass. The studies on PbS nano particles has been less as compared to CdS and CdSe as suitable preparation techniques are not available. This paper reports the chemical solution deposition (CSD) of PbS nano particles. For this methanolic solution of $Pb(Ac)_2$ and thiourea (LAT) was used under different conditions. When a solution was kept at about 25 ^oC, the colour changed gradually from pinkish brown to light brown in 15 min. After 4 h red brown particles were dispersed in the solution which turned black after another 2 h. X-ray diffraction confirmed the formation of PbS. Scanning electron microscope revealed that the particles had flake type structure which coalesced to form spheres. The LAT solution was subjected to ultrasonic waves. The conversion to PbS was faster but the colour of particles in solution changed gradually from yellow, orange, light brown, dark brown and black depending on time. To stop the growth of particle at any stage a new capping agent , protein hydrolysate, was used by adding its powder to the solution. Solutions of different colours could be made. The nano particles has been characterized by X-ray diffraction and scanning electron microscope.