

XRD and SXM investigations on nanocrystalline PbS

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We have performed XRD and scanning tunneling/atomic force microscopy (STM/AFM) measurements on nanocrystalline PbS. The PbS particles, which were produced by the inert gas condensation method were either deposited on substrate surfaces or compacted into macroscopic samples. The XRD measurements performed on powders as well as on compact pellets show that the resulting material consists only of the ordered cubic crystalline structure of PbS. The AFM measurements on PbS covered substrates show agglomerates which could be resolved by STM. The agglomerates are composed by small PbS nanocrystals, exhibiting a grain size of approx. 5 nm. The electronic properties of these ultras-small grains should thus involve pronounced quantum phenomena.