



Influence of Liquid Crystal Ligands on the Optical and Monolayer Properties of CdSe Quantum Dots

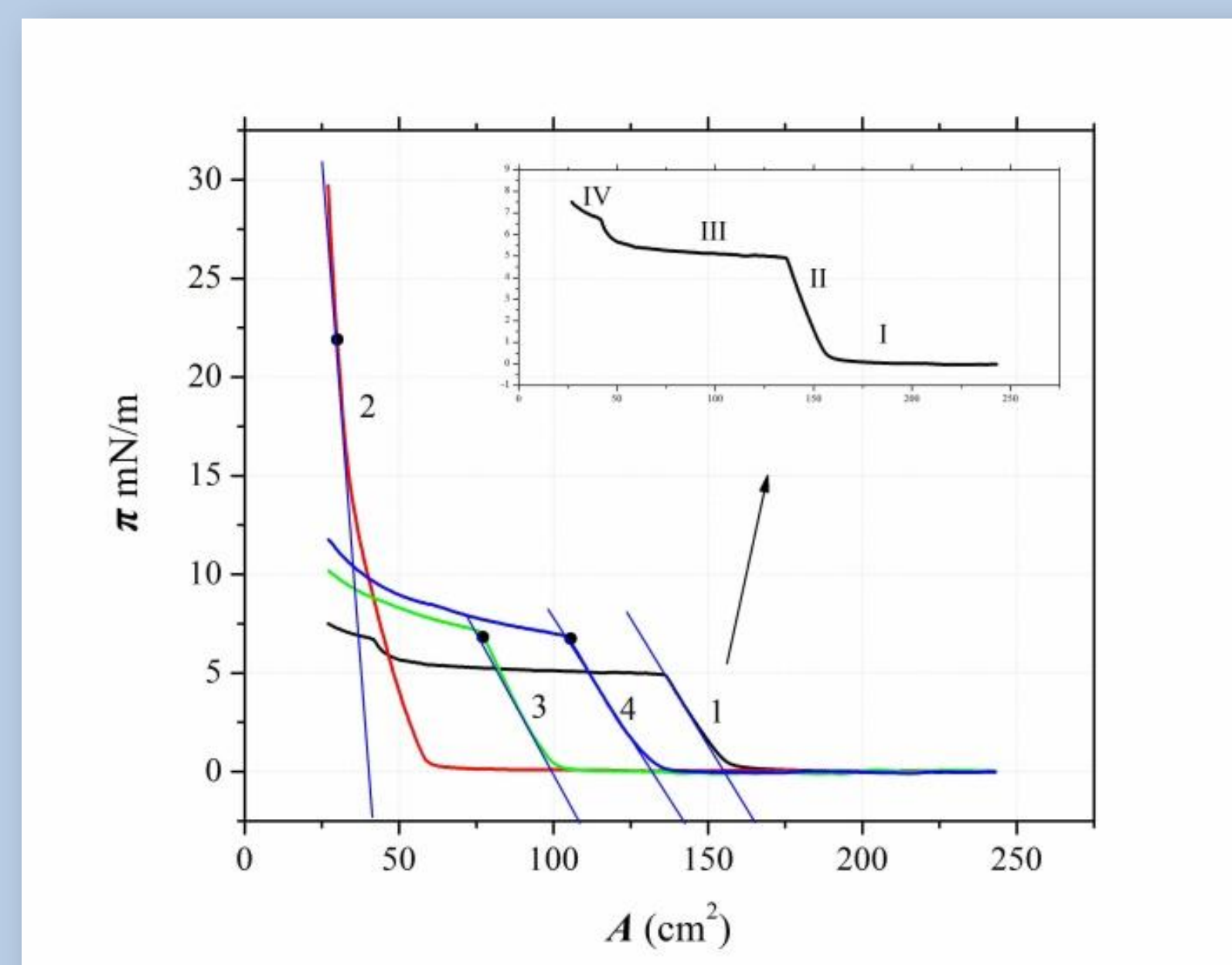


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Short abstract

The dispersion of quantum dots (QDs) in liquid crystal solution has an interesting field in hybrid materials for optical applications. We investigate the dispersion of quantum dots in different liquid crystal phases. Quantum dot self-assembly in the liquid crystal is dependent on particle surface properties and concentration in the liquid crystal medium. By varying these parameters of water subphase (Langmuir Blodgett) we observe some fascinating structures and changes in the properties of Langmuir monolayer.

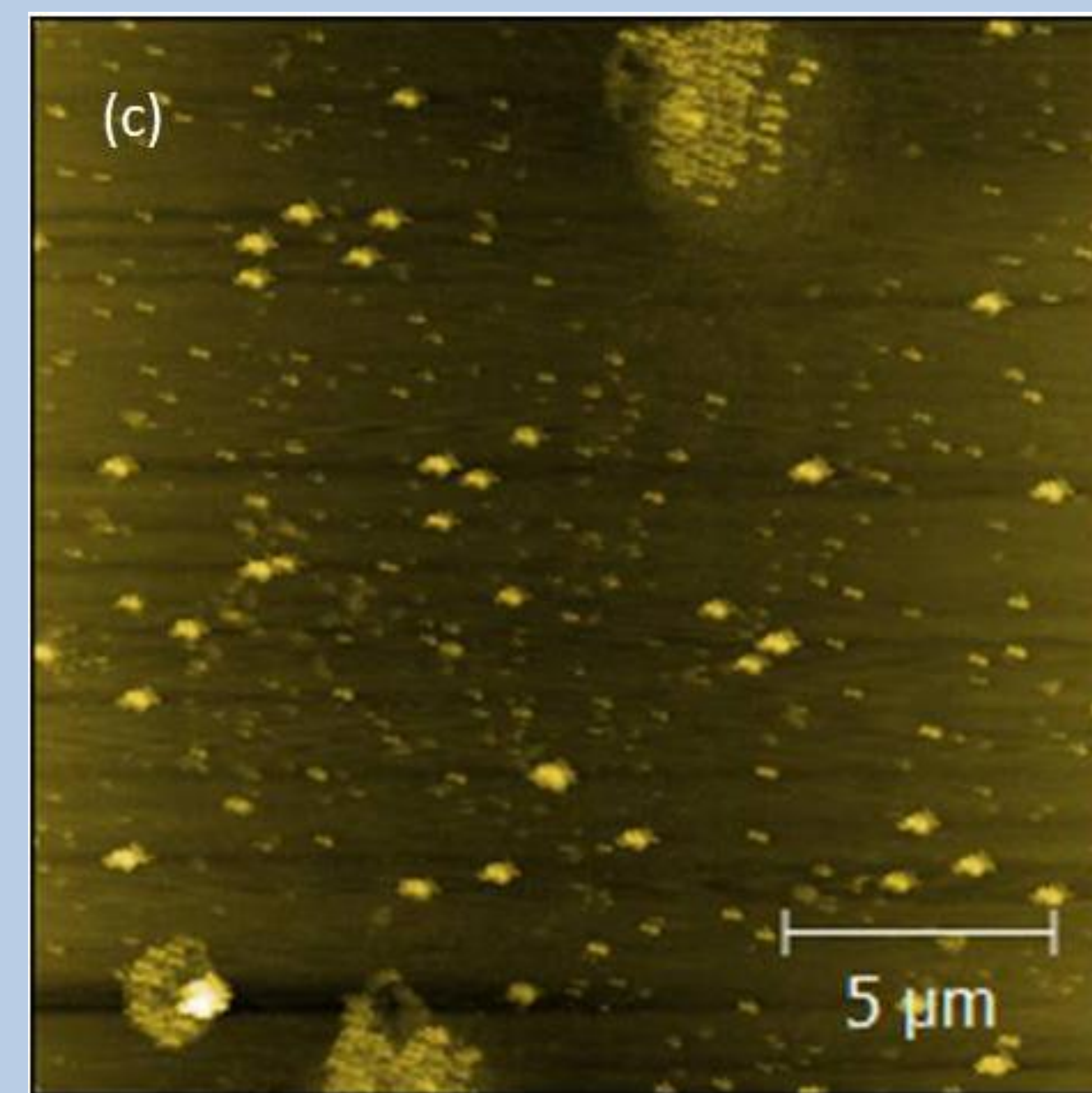
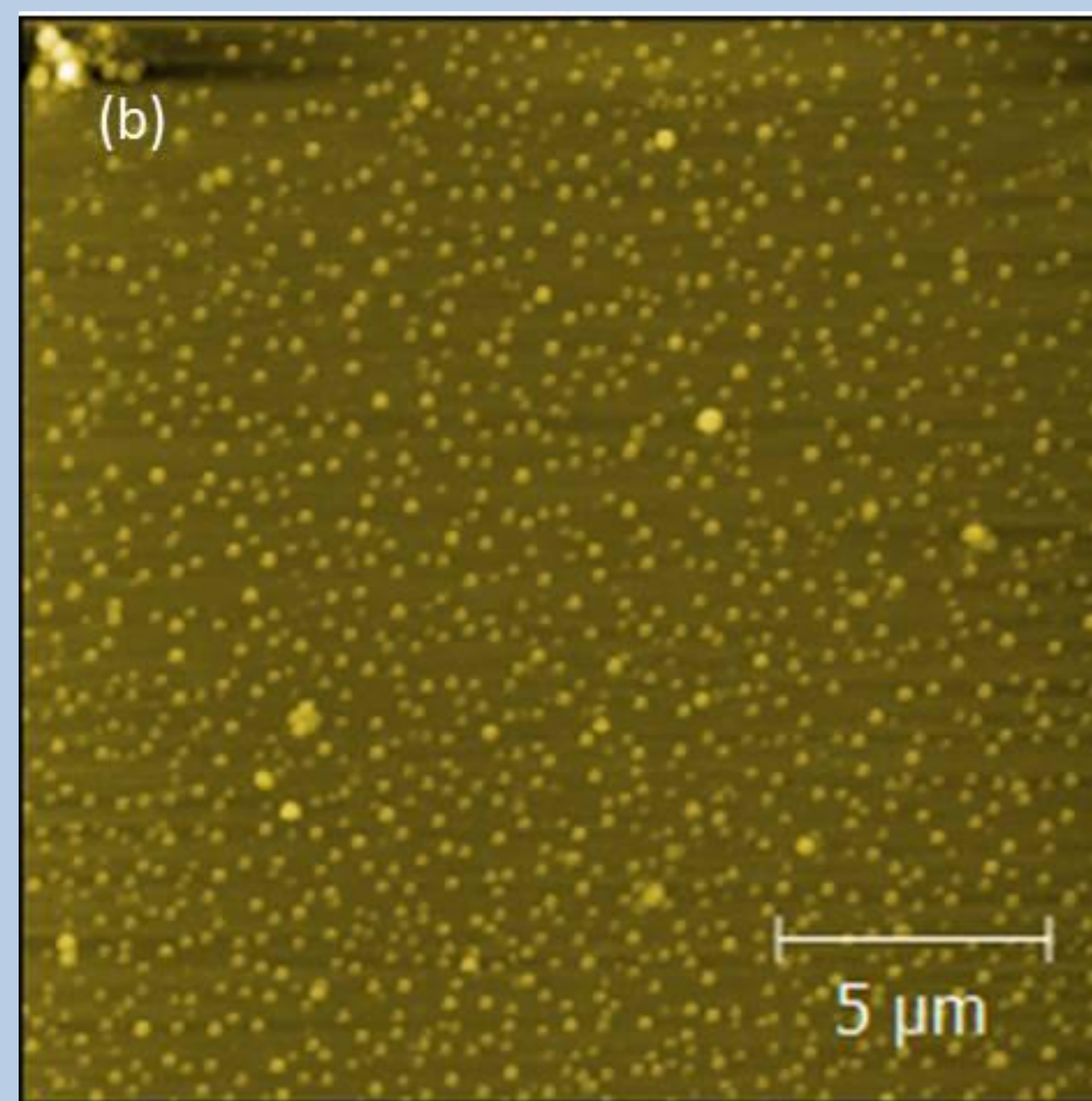
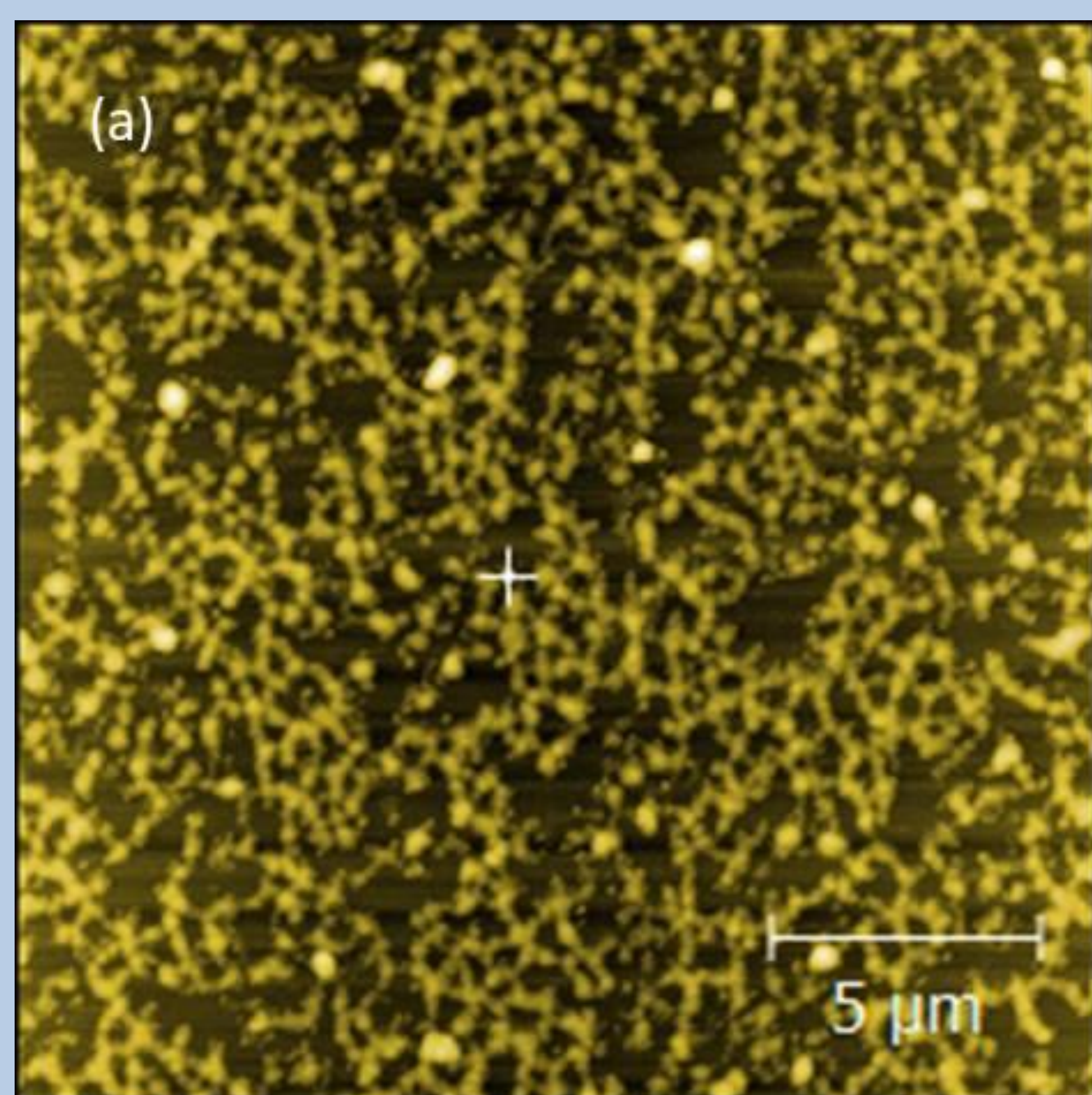
Langmuir monolayers



Langmuir isotherms of LC (1), QDs (2), QDs:LC 1:1 (3) and QDs:LC 1:2 (4).

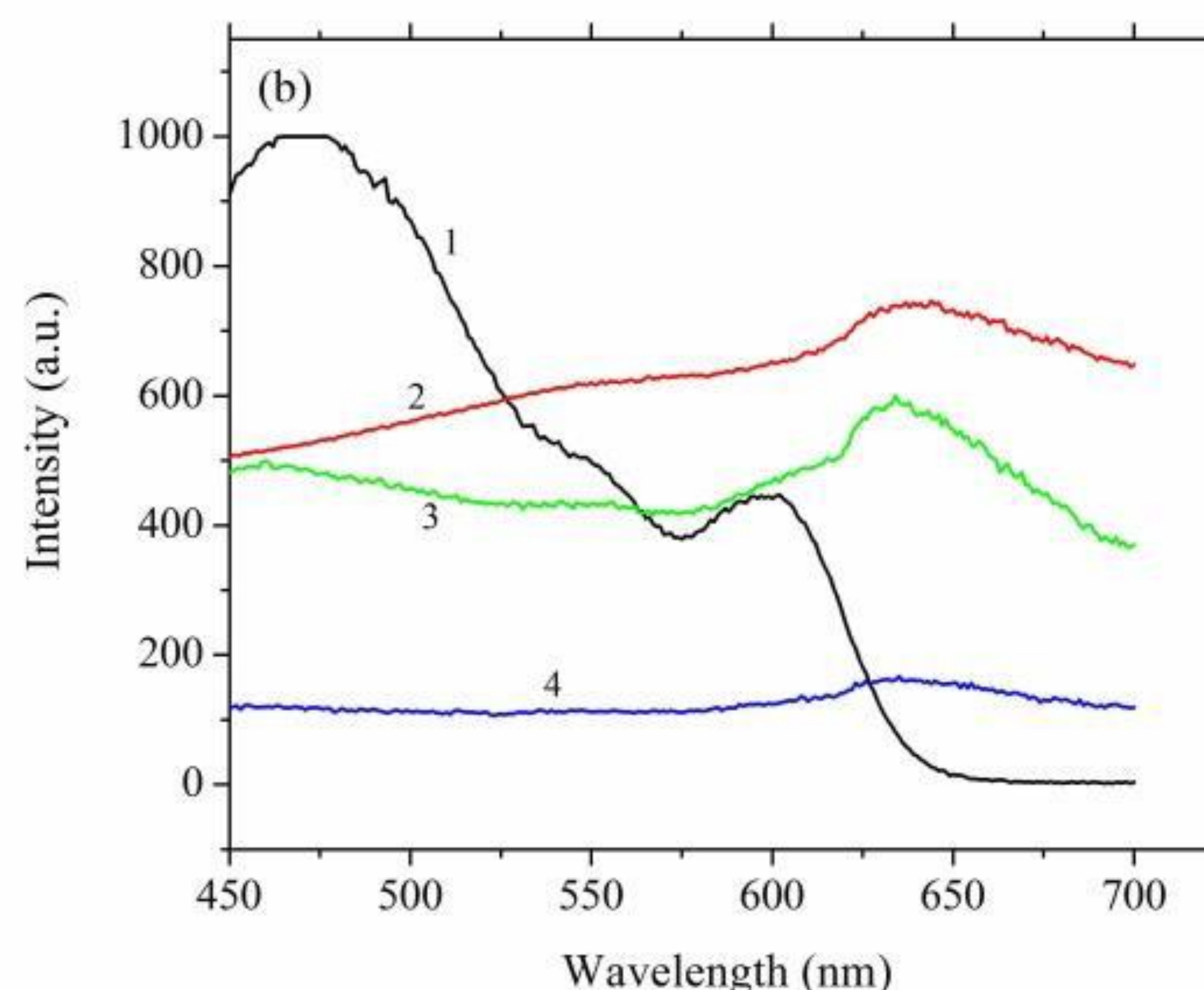
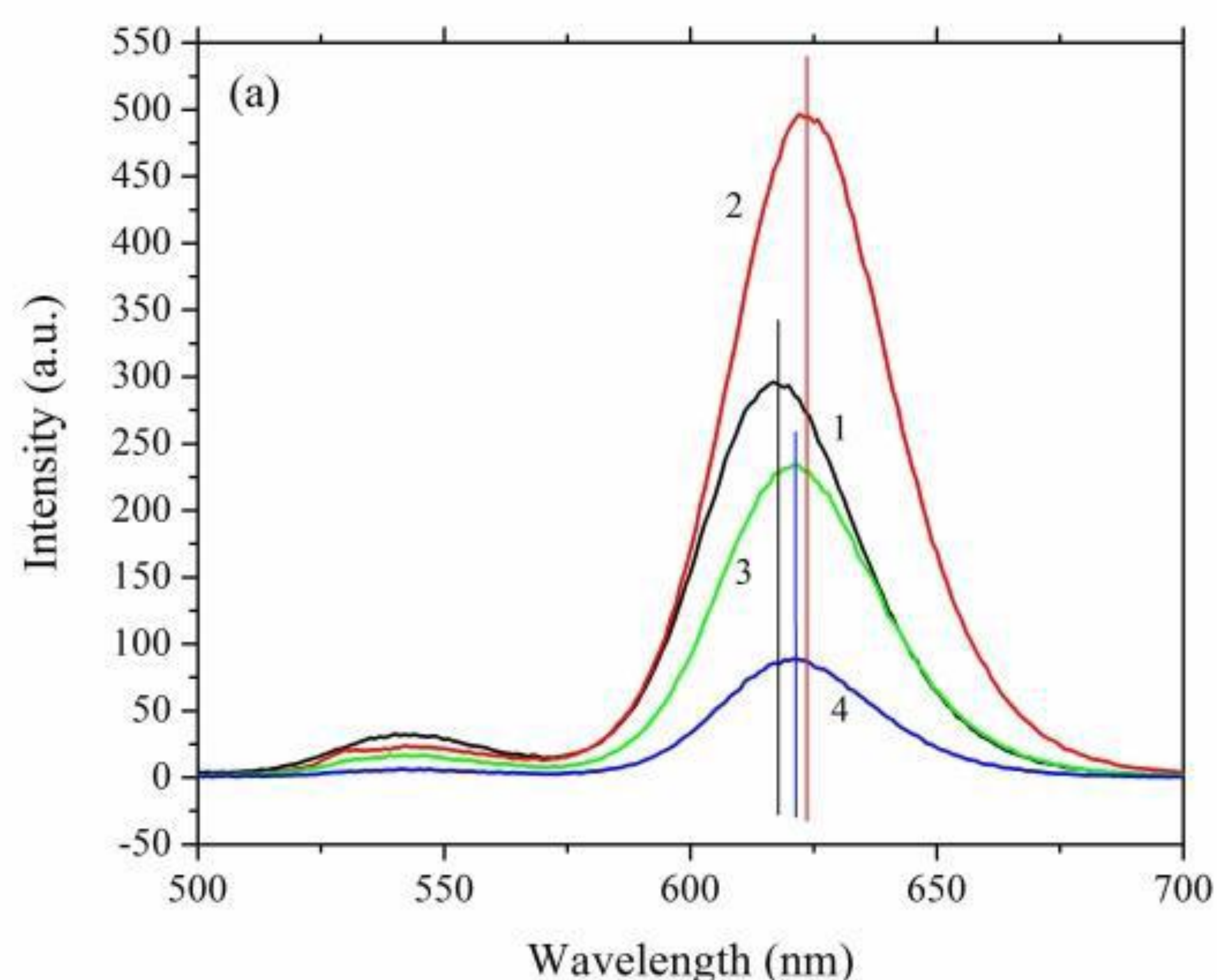
The structure of the hybrid material depends on the surface properties of QDs and the liquid-crystalline (LC) properties of the host phase. The thin film of QDs (with oleic acid) and QDs:LC (1:1 and 1:2) transferred on glass substrates at surface pressure 22, 6.9 and 6.9 mN/m, respectively.

Atomic force Microscopy



AFM images of CdSe QDs (a), QDs:LC 1:1 was cooled at room temperature (b), QDs:LC 1:1 was cooled at -18°C (c)

Optical properties of CdSe and LC solutions



Emission spectra (a) and excitation spectra (b) for solutions of QDs with OA stabilizer (1), QDs solution without OA stabilizer (2), QDs:LC 1:1 (3) and QDs:LC 1:2 (4).