Electrostatic Self-Assembly of Binary Nanoparticle Crystals with a Diamond-Like Lattice

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Particle Crystals

Applications

1) Optoelectronics
2) High-density data storage
3) Biological sensing

Electrostatic self assembly
ω-functionalized alkane thiols: HS(CH₂)₁₀COOH (MUA) and HS(CH₂)₁₁NMe₃+Cl⁻ (TMA)
\[ 2\theta = 0.801^\circ, 1.308^\circ, \text{ and } 1.539^\circ \text{ for (111), (220) and (311).} \]

Inter particle distance \( \sim 8.5 \text{ nm} \)
Conclusion

1) Synthesized particle crystals by utilizing the charge neutralization.
2) Shown that the crystals formed have diamond like structures.
3) Optimized the size distribution of nanoparticles which results the high quality crystals.