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

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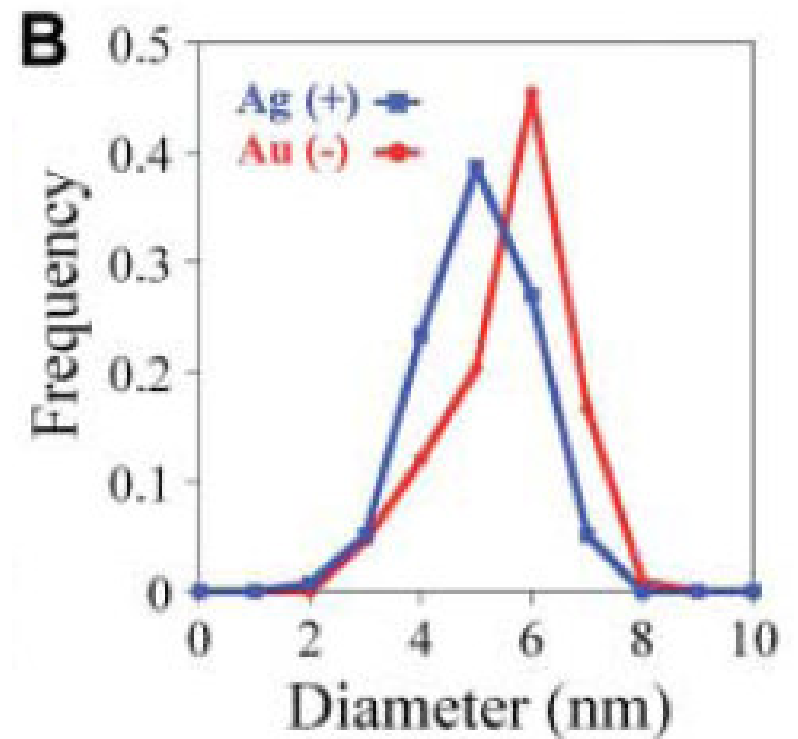
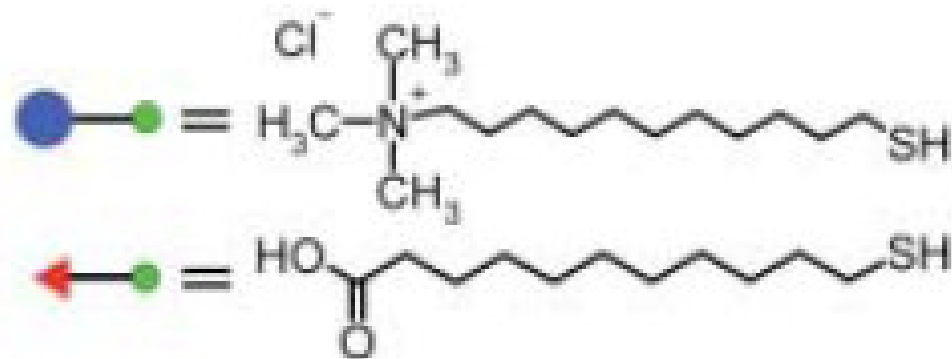
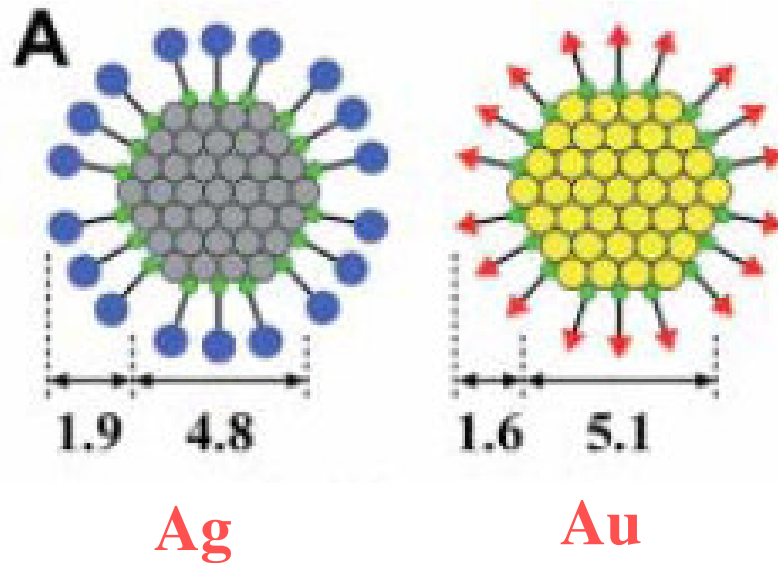
Particle Crystals

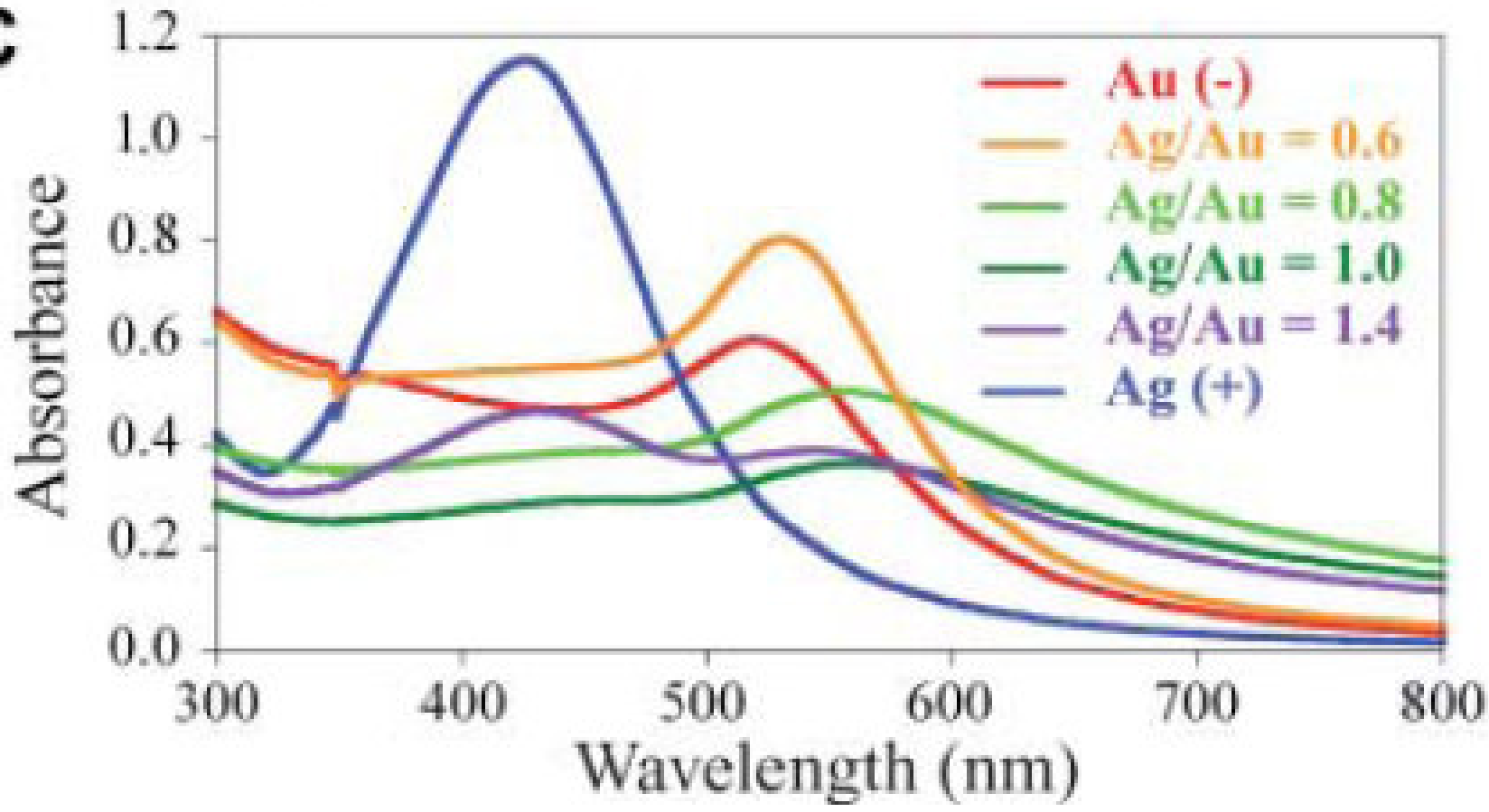
Applications

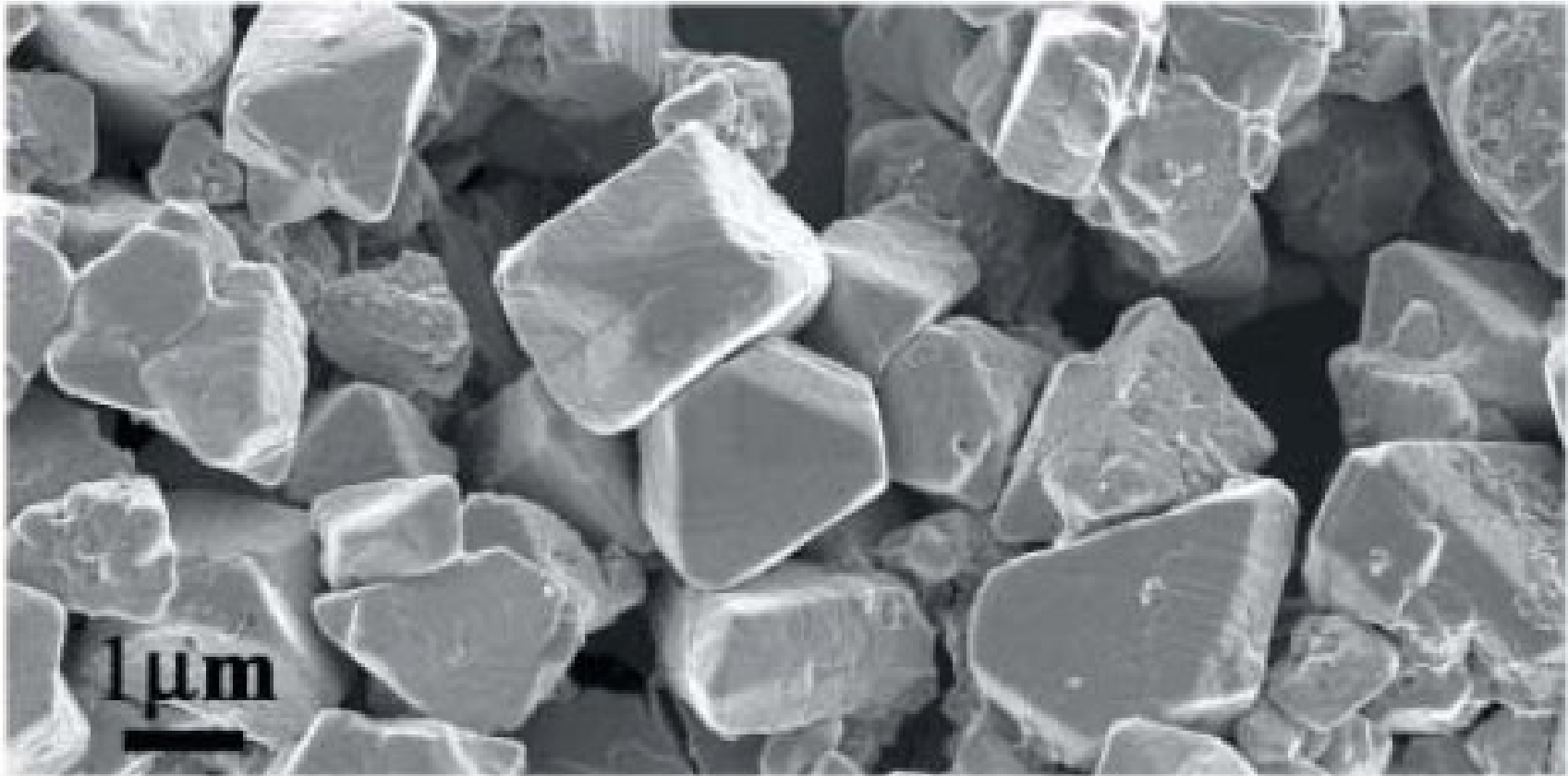
- 1) Optoelectronics
- 2) High-density data storage
- 3) Biological sensing

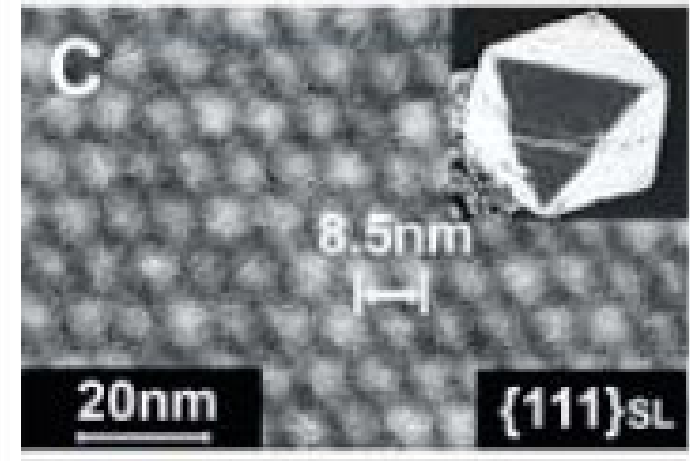
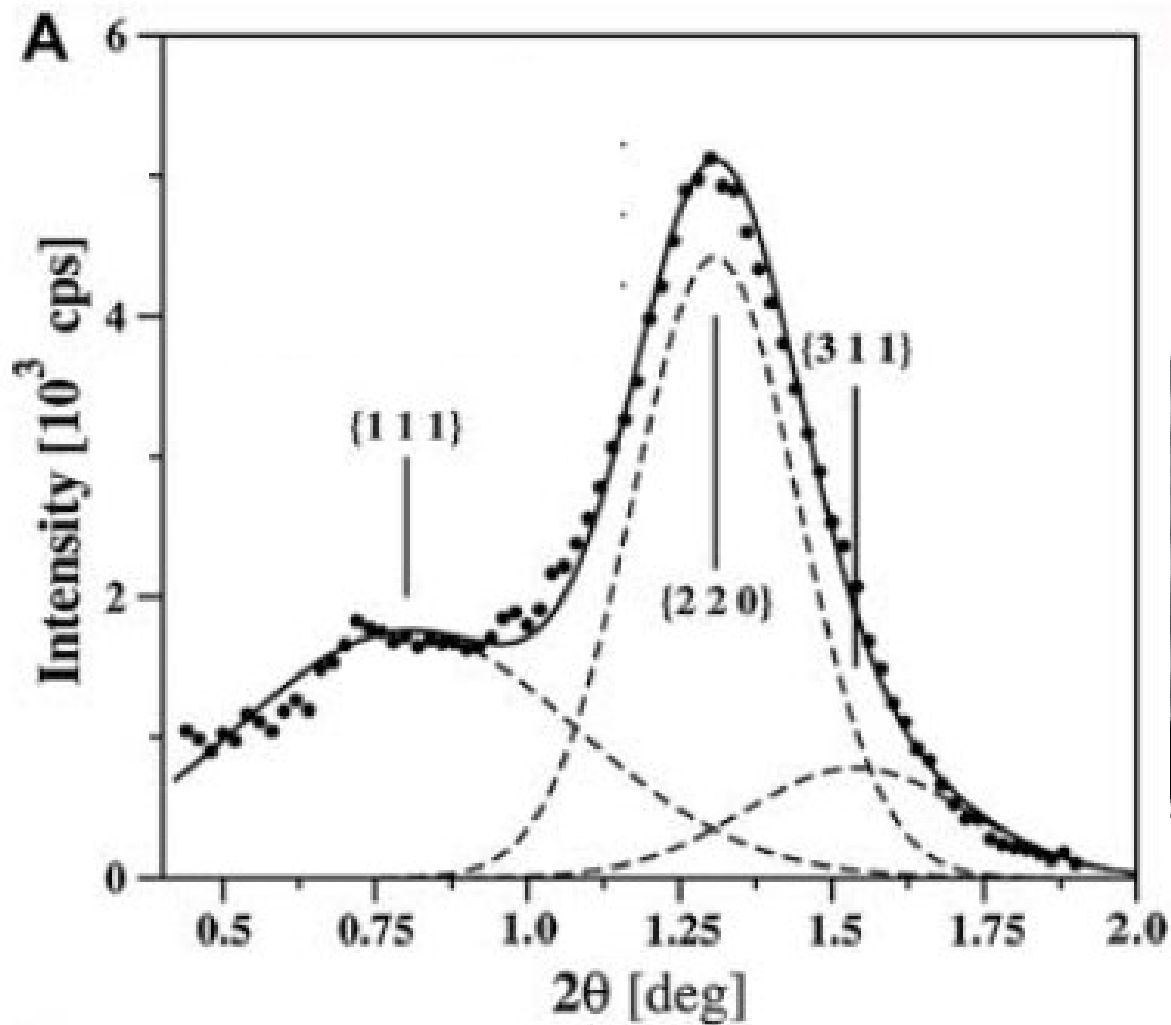
Electrostatic self assembly

ω -functionalized alkane thiols: HS(CH₂)₁₀COOH (MUA) and HS(CH₂)₁₁NMe₃⁺Cl⁻ (TMA)



C

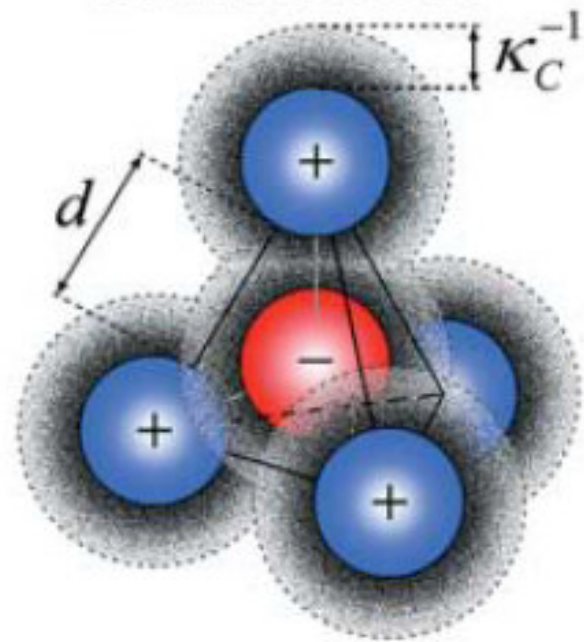




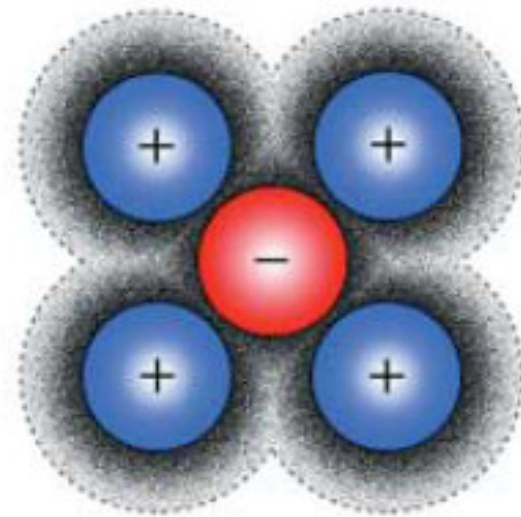
$2\theta = 0.801^\circ, 1.308^\circ, \text{ and } 1.539^\circ$ [(111), (220) and (311).]

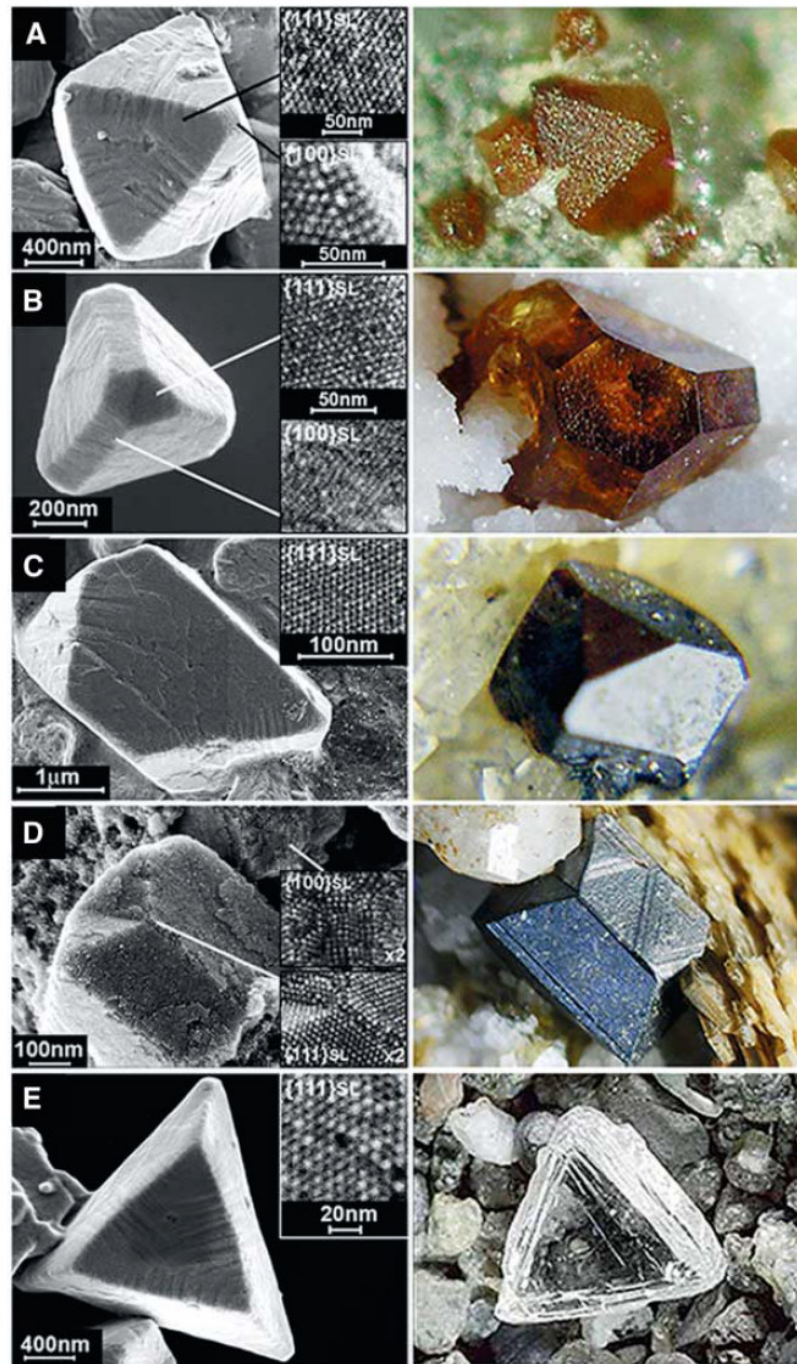
Inter particle distance ~ 8.5 nm

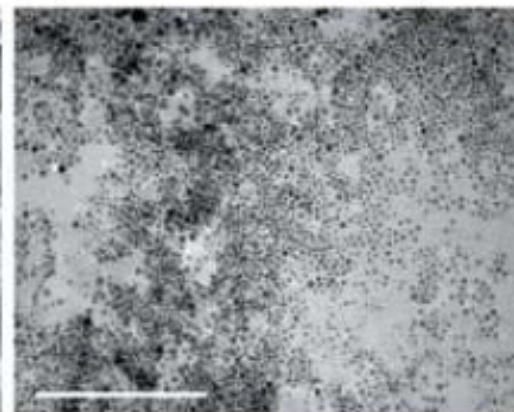
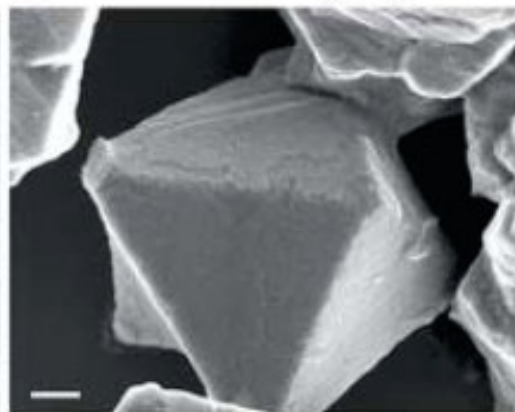
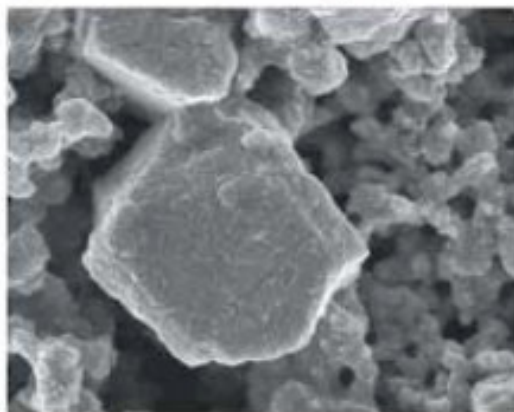
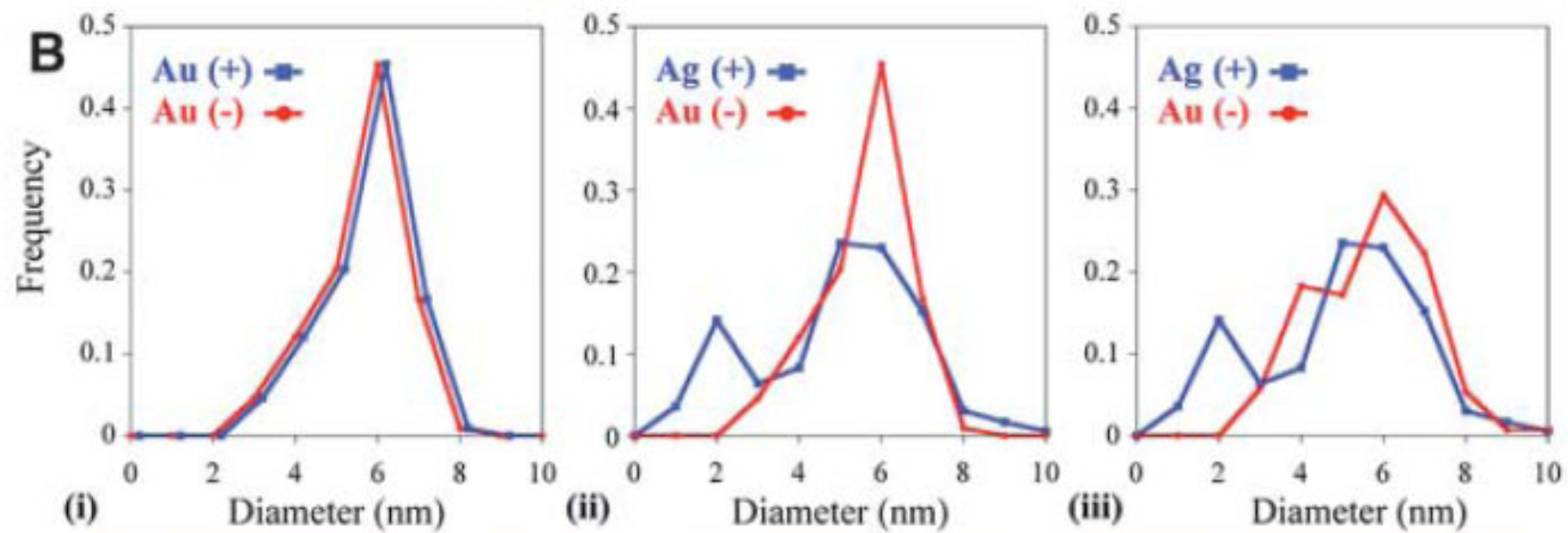
Diamond Lattice



NaCl, CsCl Lattices







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.