

# Hydrothermal Synthesis of Monodispersed Octahedral Gold Nanocrystals with Five Different Size Ranges and Their Self-Assembled Structures

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- 1. Synthesis of anisotropic nanoparticles**
- 2. Arrangement of anisotropic nanoparticles**
- 3. SERS**
- 4. IR-Absorption**

# Synthesis of Octahedral gold nanoparticles

9.7 mL of ultrahigh purity water, 0.055 g of CTAB, 250  $\mu\text{L}$  of 0.01 M  $\text{HAuCl}_4$ , and 50  $\mu\text{L}$  of 0.1 M trisodium citrate were added to a glass vial with a Teflon-lined polypropylene cap and a volume capacity of 22.5 mL. CTAB concentration in the final solution is  $1.51 \times 10^{-2}$  M. The oven temperature was set at 110  $^{\circ}\text{C}$ . Sample vials were loaded into the oven after it had reached this temperature. Sample vials A-E wrapped in aluminum foil were respectively heated for 6, 12, 24, 48, and 72 h. After that, the vials were removed from the oven and cooled naturally to room temperature. UV-vis absorption spectra of these solutions were taken. To remove the residual CTAB surfactant, the solutions were centrifuged at 6000 rpm for 20 min (Hermle Z323 centrifuge). The supernatant was decanted, and the precipitate was redispersed in deionized water for another round of centrifugation. Finally the nanocrystals were stored in deionized water.



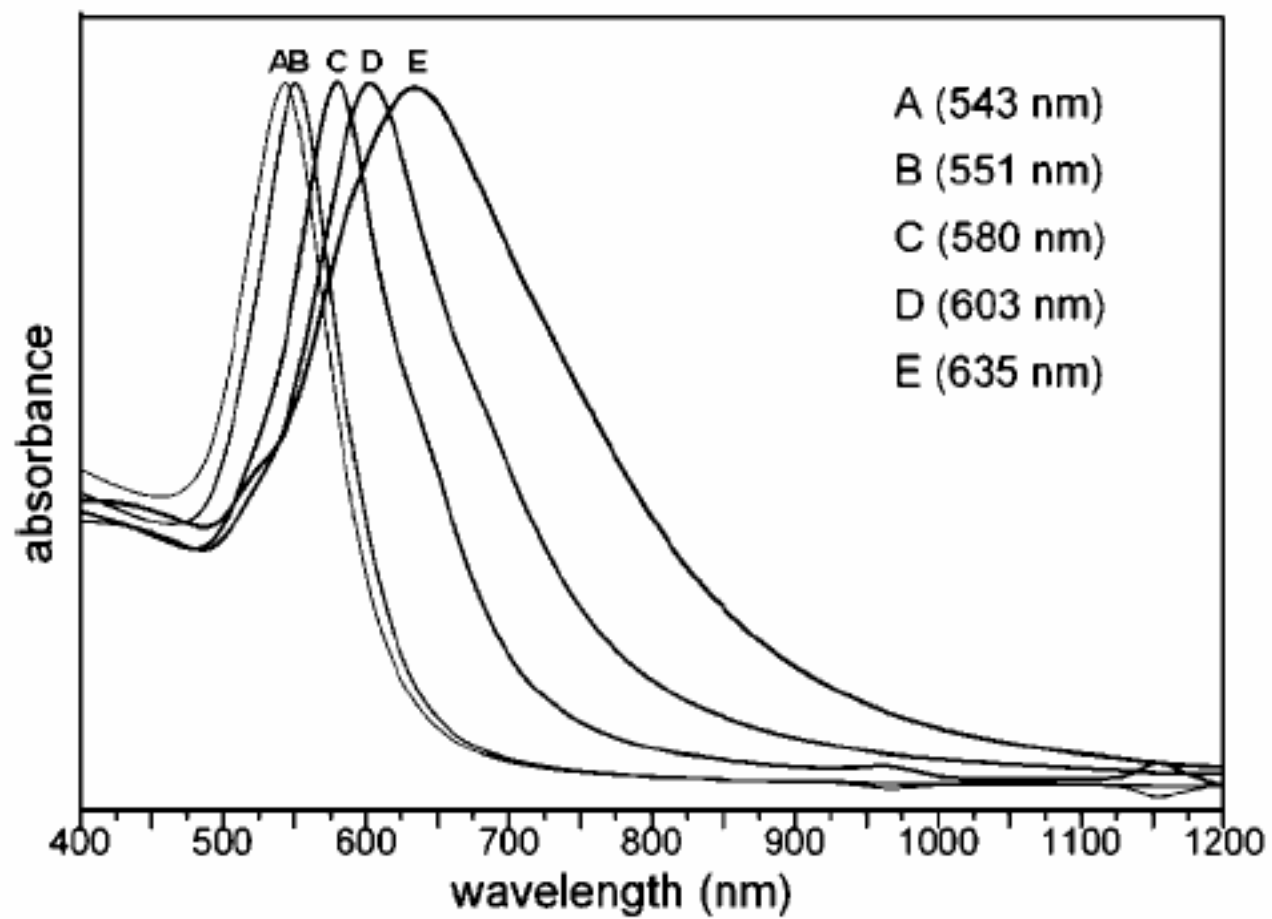
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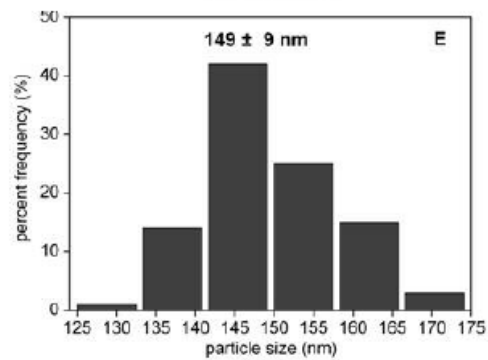
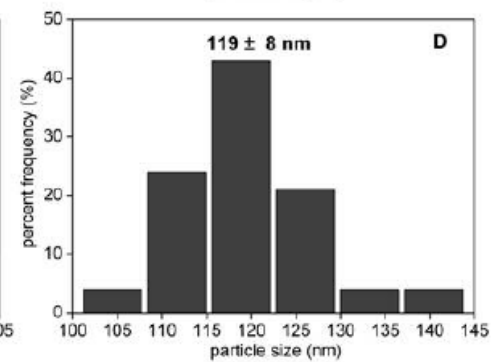
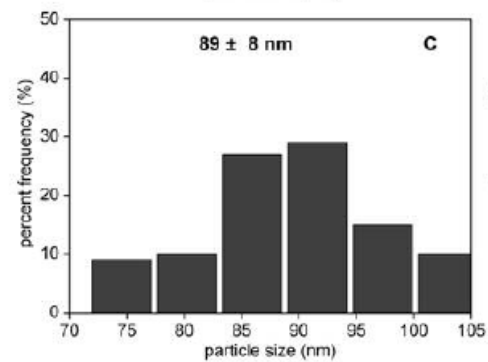
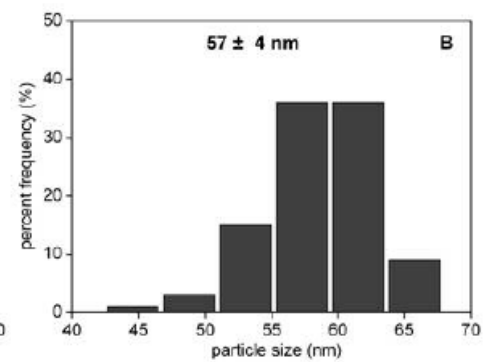
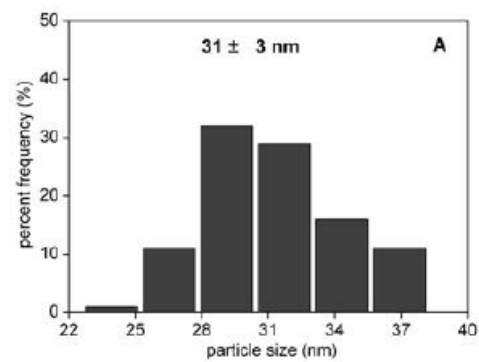
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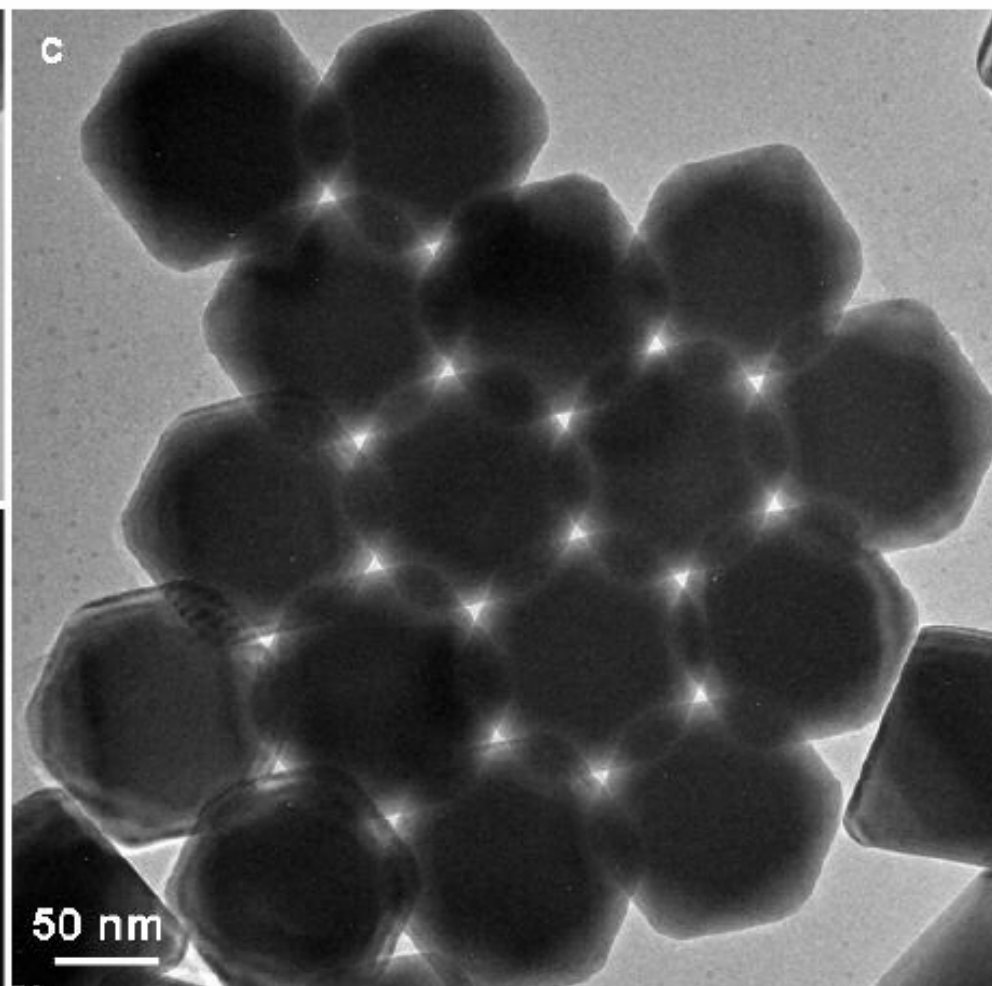
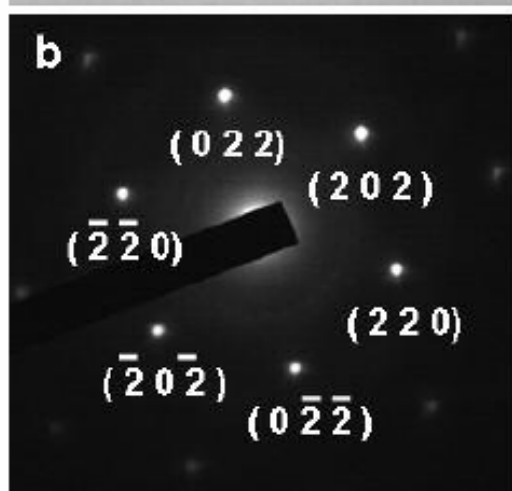
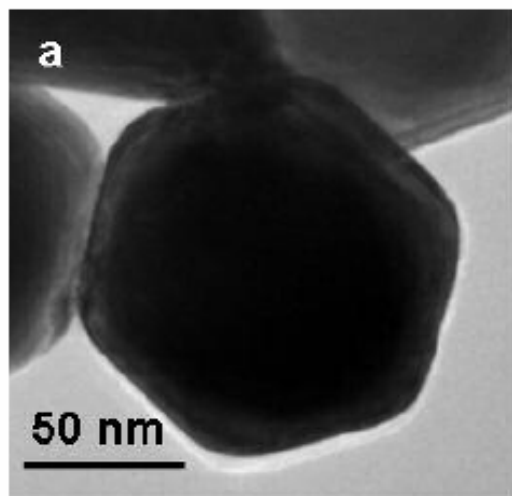
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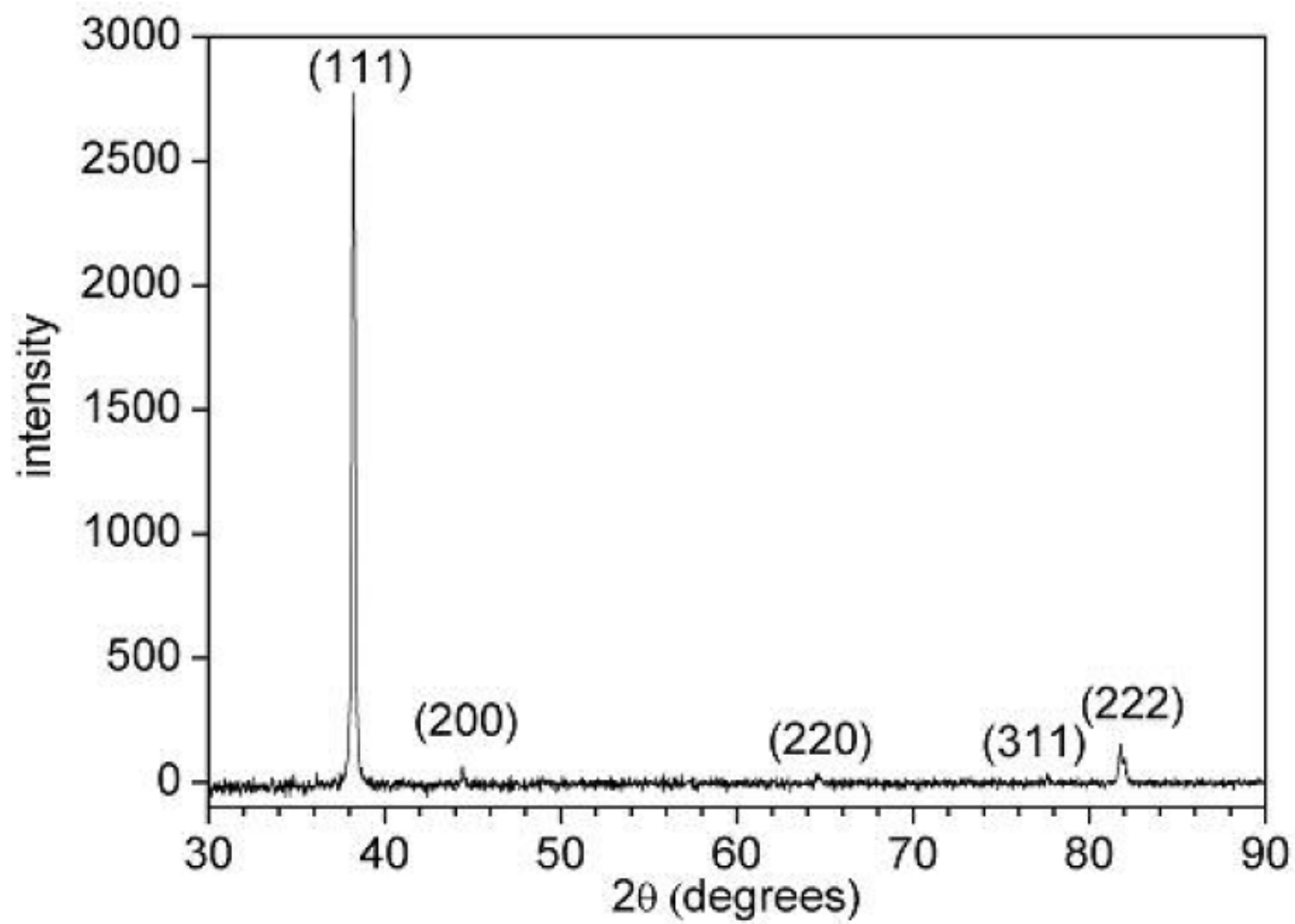
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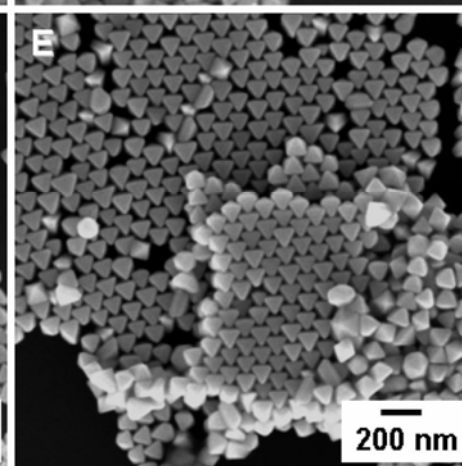
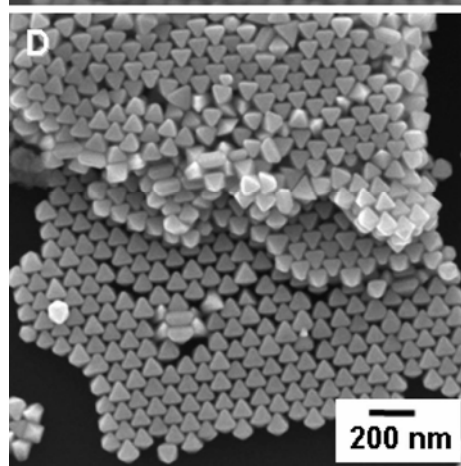
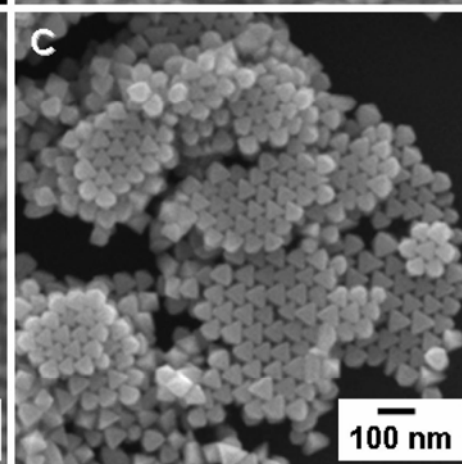
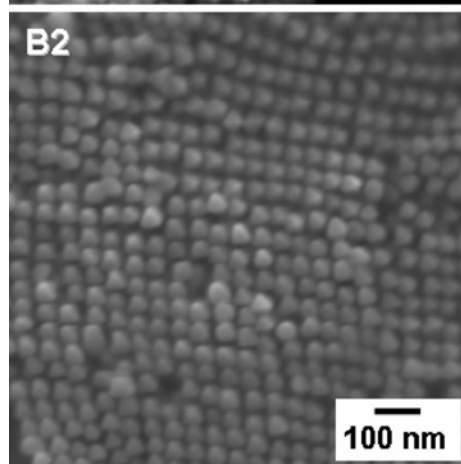
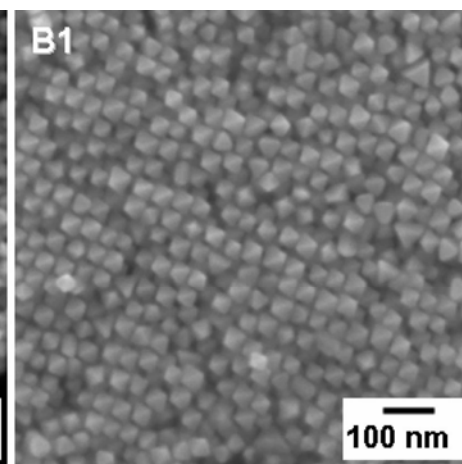
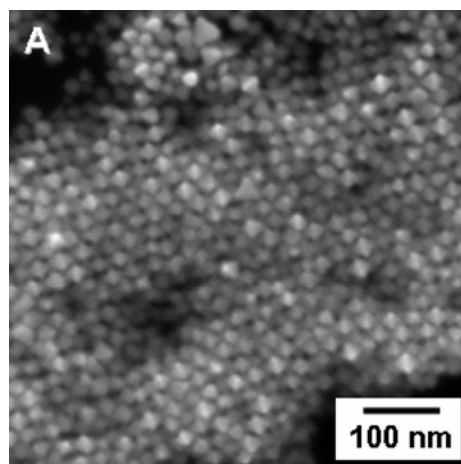


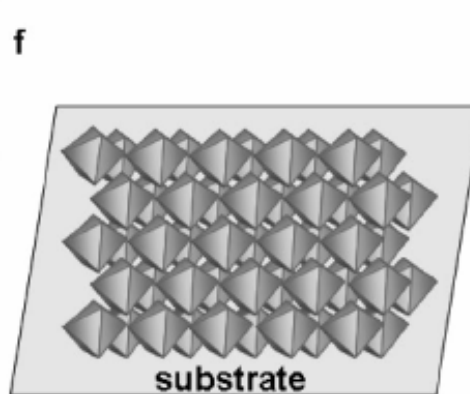
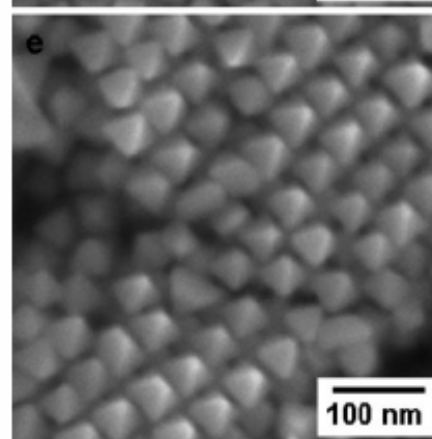
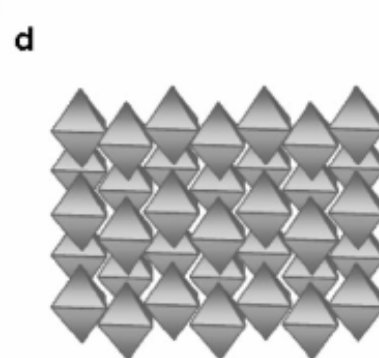
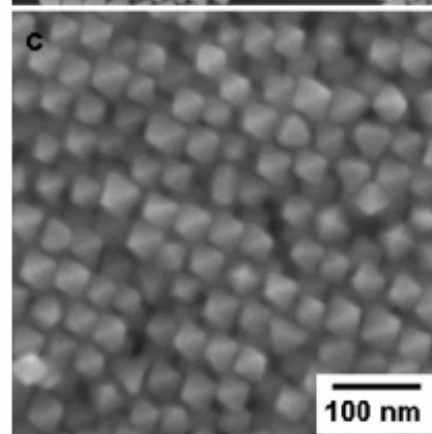
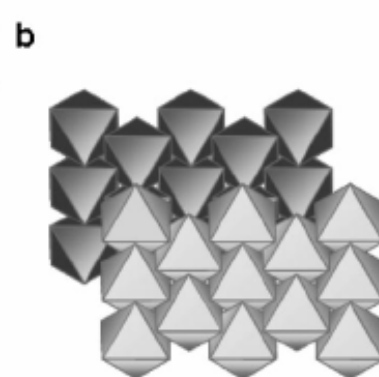
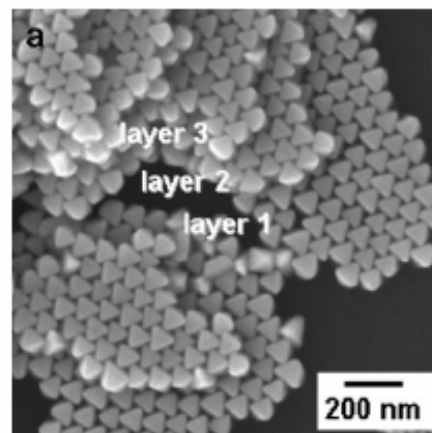


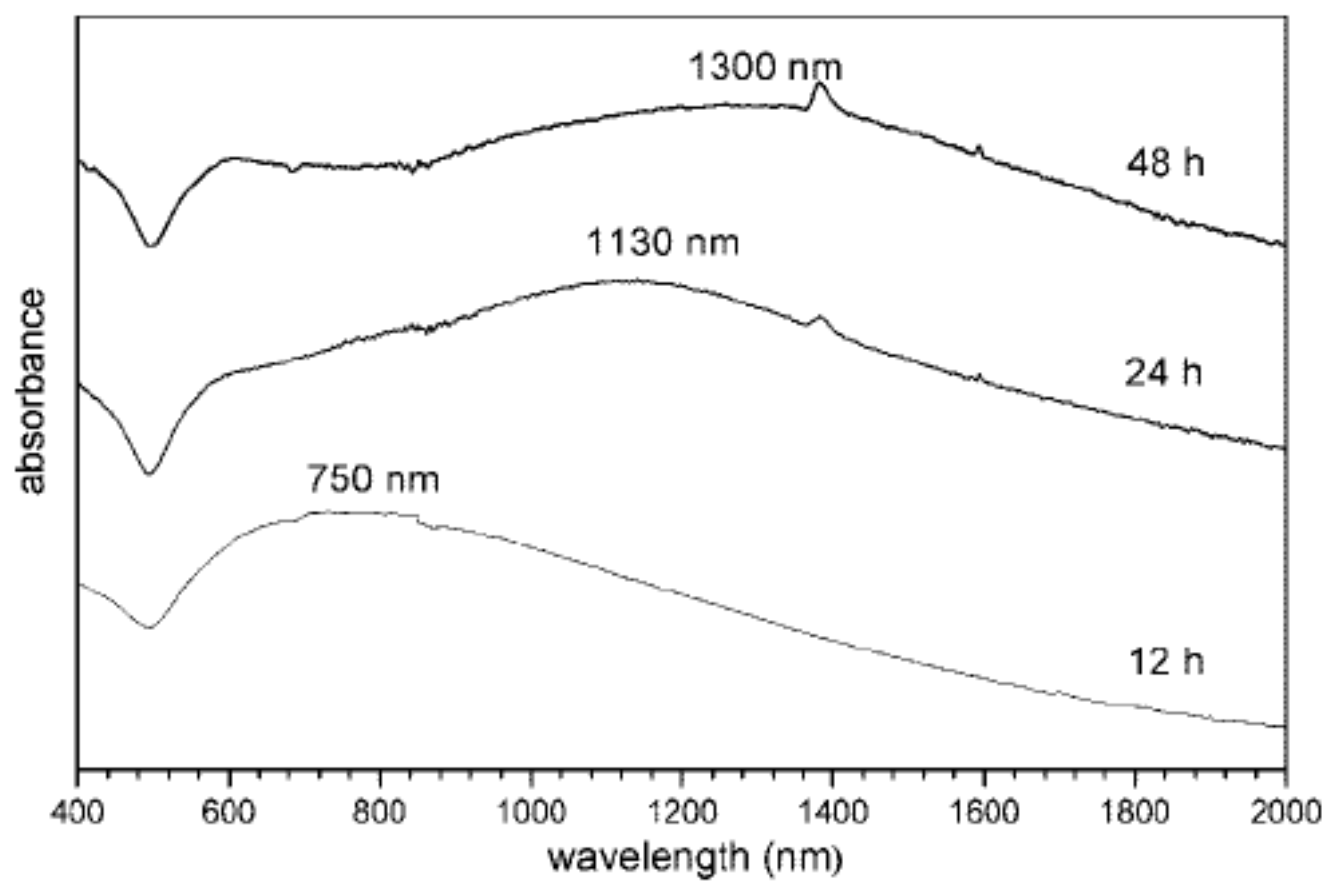


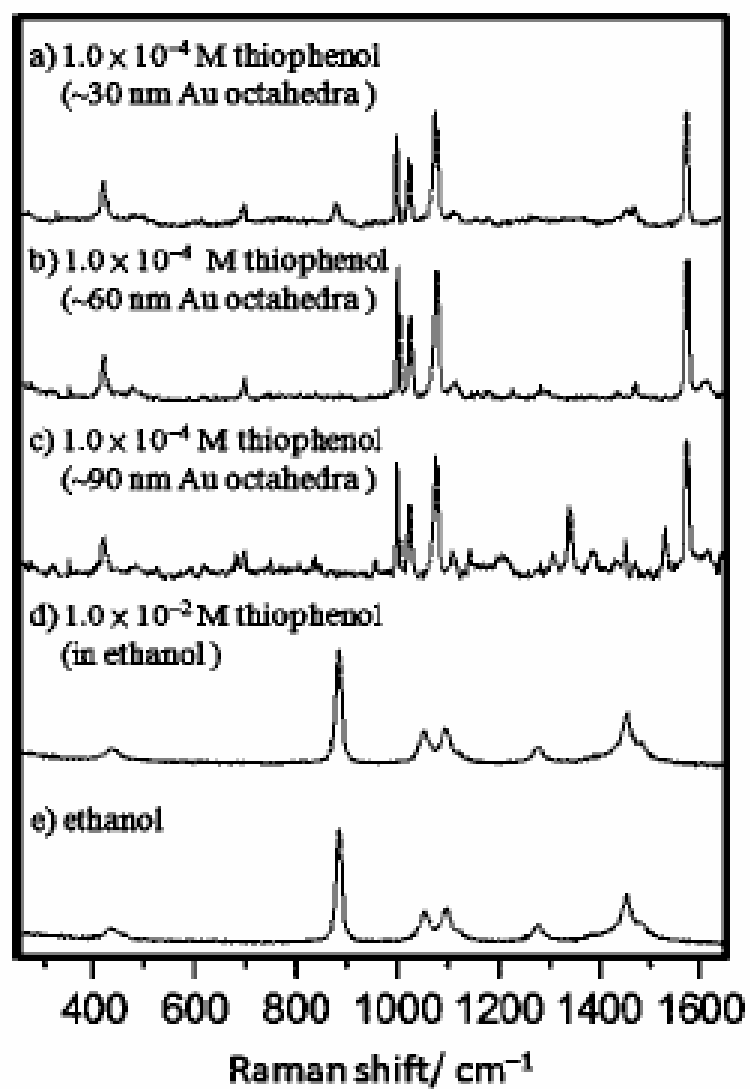


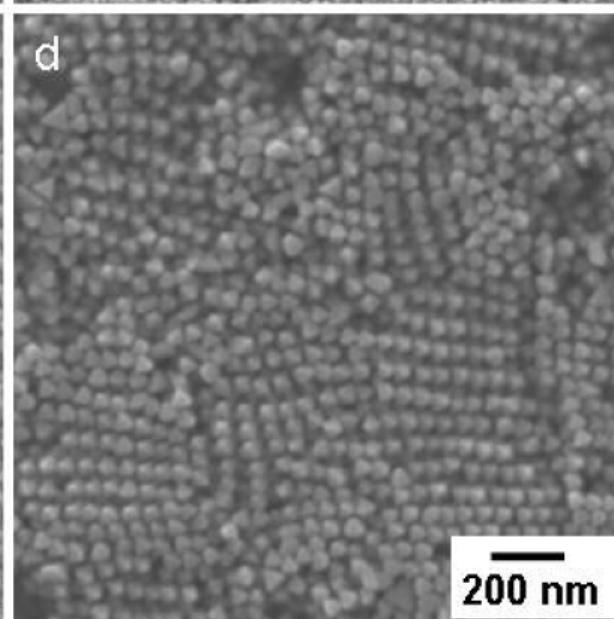
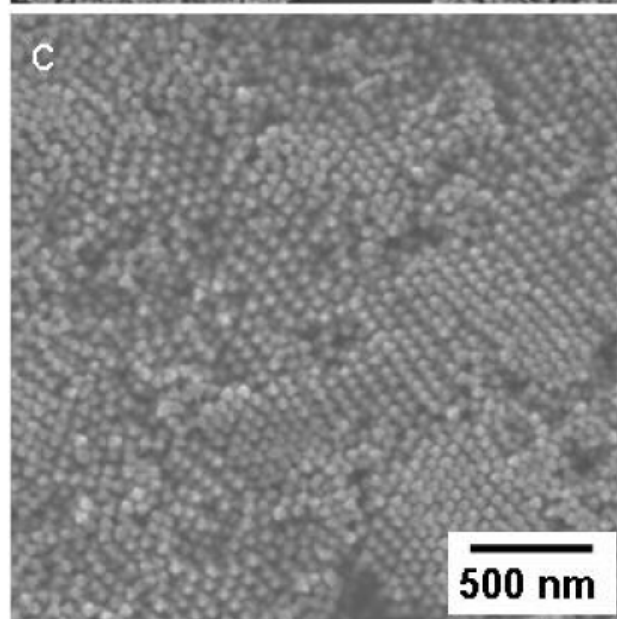
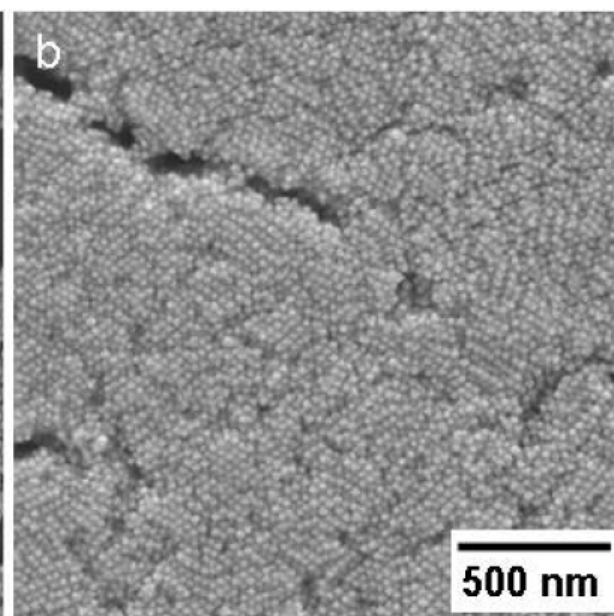
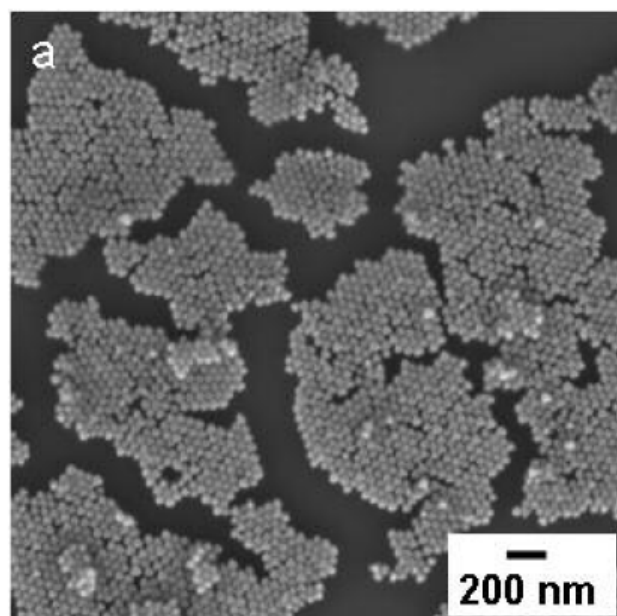












# Conclusion

1. *Synthesized octahedral gold nanocrystals by Hydrothermal method.*
2. *Arranged these crystals in to micrometer regime.*
3. *SERS were measured.*
4. *IR-Absorption were measured.*