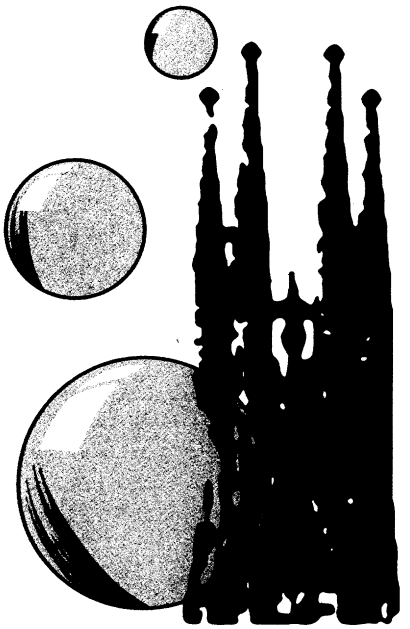

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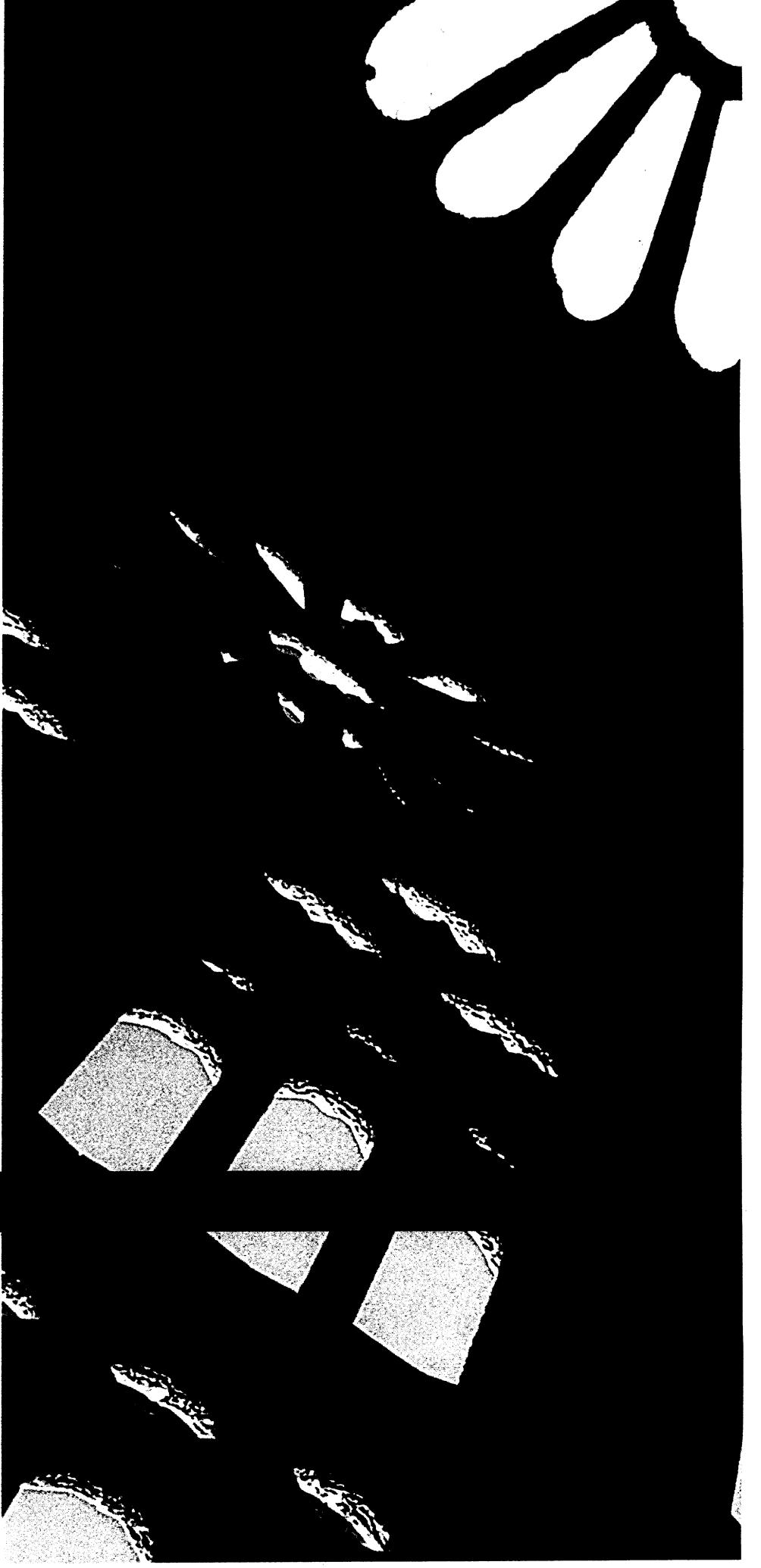

Abstracts

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O-041 DISTRIBUTION OF MACROPORES IN SILICA PARTICLES PREPARED BY USING MULTIPLE EMULSIONS

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The distribution of macropores in silica particles prepared by the hydrolysis and condensation of TEOS in hexane/water/decylalcohol (O1/W/O2) multiple emulsion was investigated. To stabilize the emulsion structure, hydroxypropyl cellulose (HPC) was added into O2 phase and polyethylene glycol (PEG) was added into the water phase. Without HPC, the particles have the irregular shape and hardly have the particular form. As the concentration of HPC increased, the shape of particles become more and more spherical form and the size was decreased. The size of silica particles was varied from 5 to 1 _m as the concentration of HPC increased from 0.5 to 0.7 wt%. The number and size of the macropores in silica particles were affected by PEG polymer concentration. With the variation in the concentration of PEG, macropores in silica particles were located at the surface or inside of the particles. At high concentration of PEG, the macropores in particles were located inside of the particles, but at low concentration of PEG the macropores were located at the surface of particles. Interestingly, the particles of dimpled surfaces were formed when the molar ratio of water to TEOS (Rw) was 4.0 and the concentrations of PEG and HPC were 2.0 and 0.7 wt.% respectively. The surface areas measured by BET method of dimpled silica particles and completely spherical particles were 409 and 433 m2/g respectively.

O-058 GOLD COLLOIDS FROM CATIONIC SURFACTANT SOLUTIONS. HOW ELECTROLYTES CONTROL PARTICLE MORPHOLOGY

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The photochemical reduction of gold salts with UV-light in cationic surfactant solutions leads to particles with rodlike morphologies [Esumi et al., Langmuir 11, 3285 (1995)]. In this work we investigate the formation mechanisms of elongated gold particles in solutions of alcyltrimethylammonium salts in the presence and absence of a variety of electrolytes. Transmission Electron Microscopy and a variety of spectroscopic methods provide evidence that the formation of long, threadlike gold particles is not due to a micellar templating effect, but probably arises from a complex sequence of particle aggregation processes. Electrolytes are found to play a dual, dramatic role in the gold reduction process.

Insertion of electrolyte anions in the coordination sphere of Au(III) has a profound influence on the reduction efficiency and, possibly, the size and shape of the final gold nanocrystals. In addition, electrolytes interfere with the particle aggregation processes, by modifying the surface properties of the surfactant layers adsorbed on the particles.The temporal evolution of many of these crystallizing systems involves interesting intermediate structures, in which the surfactant actively participates, and which have not been observed before to our knowledge.

O-059 PREPARATION OF SPHERICAL SILICA PARTICLES

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The spherical silica particles doped with silver nanoparticles were prepared in W/O emulsion by the sol-gel reaction of TEOS. The aqueous silver colloid solution as water phase and n-decyl alcohol as oil phase were used in emulsion. The Span 80 was used to form W/O emulsion. The stability of emulsion during the sol-gel reaction was a crucial factor for the formation of spherical silica particles. Without the oil-soluble polymer in decyl alcohol as an emulsion stabilizer, the spherical silica particles were not formed. Also the high viscosity of aqueous droplets caused by adding water-soluble polymer in silver colloid solution hindered the formation of spherical silica particles. This might be due to the limited movement of hydrolyzed TEOS molecules in aqueous droplets. The amount of silver nanoparticles in colloid solution did not influence the shape of particles. The size of spherical silica particles was 1-3 ?m and the silica particles were composed of 83.6 atomic % of Si and 16.4 atomic % of silver.