Abstract Submitted
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Plasmon-assisted surface photochemistry and nanoassembly in silver nanoparticles[1] ERICH M. SEE, Virginia Tech Department of Physics, SEYYED MOHAMMAD HOSSEIN ABTAHI, Virginia Tech Department of Chemical Engineering, XI GUO, Virginia Tech Department of Chemistry, BRENDEN A. MAGILL, WEBSTER L. SANTOS, Virginia Tech Department of Physics, RICHEY M. DAVIS, Virginia Tech Department of Chemical Engineering, HANS D. ROBINSON, Virginia Tech Department of Physics — Bottom-up self-assembly of nanostructures into larger constructs remains a difficult proposition marred by low precision and low yield. Here we report on our effort to use optical activation to drive the assembly of particles onto silver nanospheres to form well-defined dumbells. The spheres were adsorbed onto a substrate and functionalized with a photocleavable o-nitrobenzyl-based ligand, which becomes positively charged upon photactivation. Illuminating the spheres with polarized light at either visible or ultraviolet wavelengths, plasmonic effects induce preferential photocleavage on opposite poles of the spheres, where negatively charged particles then can be adsorb. We will also discuss how this technique can be extended to enable the assembly of more complex nanostructures.

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