Abstract Submitted
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Yield, Purity and Mobility of a Silver-DNA Fluorophore in Solution[1] PATRICK O'NEILL, LOURDES VELAZQUEZ, UC Santa Barbara, PETER GOODWIN, Los Alamos National Laboratory, TIL DRIEHORST, SUMITA PENNATHUR, DEBORAH FYGENSON, UC Santa Barbara — Chemical reduction of DNA oligonucleotide:Ag+ mixtures leads to the formation of fluorescent few-atom Ag clusters stabilized by the DNA. This reaction typically produces many species, some of which are fluorescent, with emission wavelengths and stabilities that vary widely with DNA sequence. While most DNA sequences studied produce many different Ag:DNA products, we identify a specific DNA sequence that strongly favors the formation of a green 11Ag cluster, stable for months under ambient conditions. We generate pure solutions of this emitter by synthesizing in the presence of excess silver and then removing free silver from solution. We report on results enabled by the purity of these samples, including determination of the extinction coefficient (using FCS), diffusion coefficient (using microfluidics) and bulk chemical yield of this fluorophore, and comment on the challenges that remain on the path to production of sufficient quantity and purity for high-resolution structure determination.

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