Exploration of Dilute Magnetic Semiconductor Quantum Dots

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Can inorganic nanoclusters incorporate magnetic dopants more readily than the addition of cationic/anionic precursor materials?

A variety of doped quantum dot systems have been synthesized, using the hot injection method. However, single source precursor materials may incorporate more dopant ions into the quantum dot.

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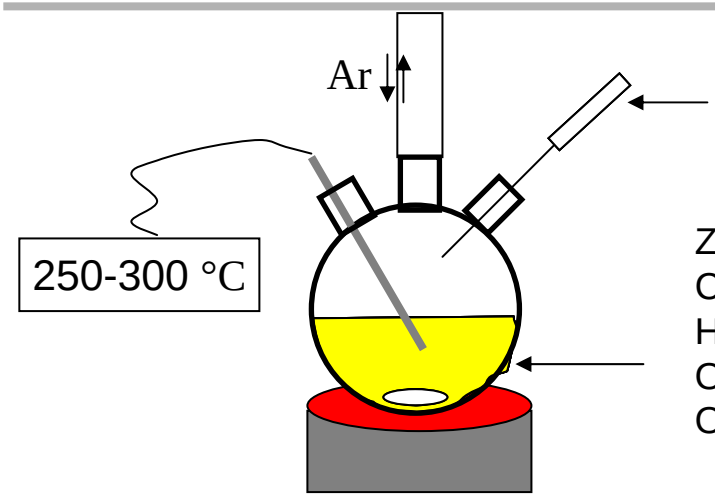
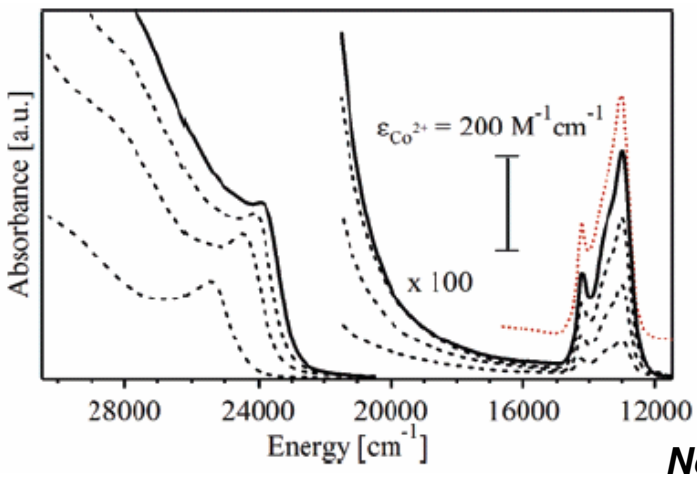


Tributylphosphine
Se
Octadecene

$Zn(OAc)_2$
$Co(OAc)_2$
Hexadecylamine
Oleic Acid
Octadecene

Hot Injection Method:

1.7% Co^{2+}:ZnSe QDs (5.4 nm diameter)



Norberg et al. J. Am. Chem Soc., 128, 40, 13195

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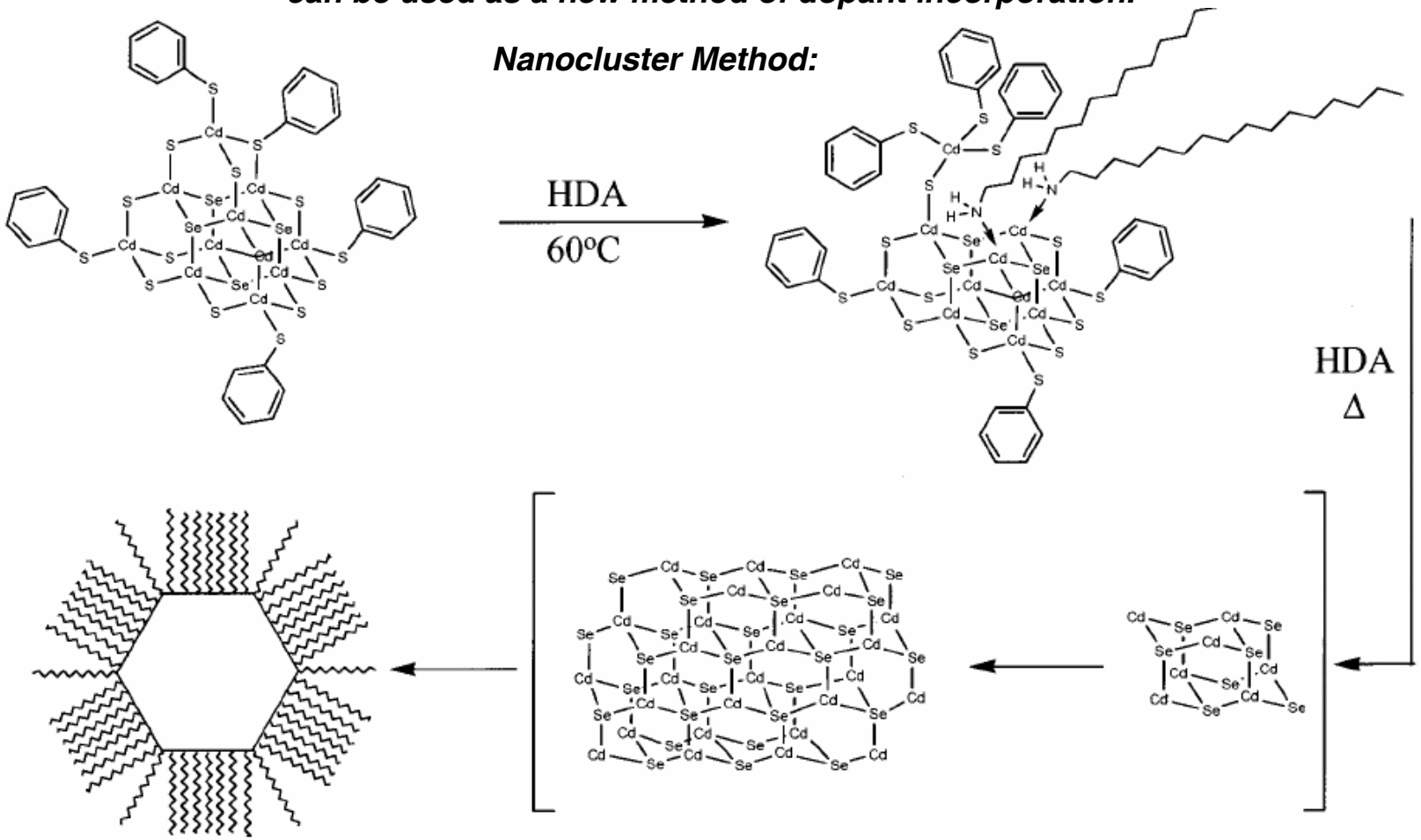
Through chemical synthesis of an inorganic nanocluster, new single source precursors of ZnSe can be used as a new method of dopant incorporation.

Nanocluster Method:



G. F. Strouse et al. ***Chem. Mater. 2002, 14, 1576***

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