



# Plasma Synthesis of Nanocrystals

**Technology ID**

z07107

## Gas-Phase Nanocrystal Synthesis Technologies Available for Licensing

Three cost effective technologies for creating nanocrystals via a gas-plasma, non-aqueous process are available to license. Gas phase production of these nanocrystals is faster, higher yield and more cost efficient than current processes. The technologies can be optioned for a six month trial period for a \$10,000 Try fee to enable testing of the commercial viability of this process to produce nanocrystals for your application.

**Category**

Engineering & Physical Sciences/Materials  
Engineering & Physical Sciences/Nanotechnology  
Engineering & Physical Sciences/Photonics  
Engineering & Physical Sciences/Semiconductor

**MN-IP Try and Buy****Try**

- \$10,000 for a six month trial
- Trial fee is waived for MN companies or if sponsoring \$50,000+ research with the University
- No US patent costs during trial

**Buy**

- \$40,000 conversion fee (TRY to BUY)
- Royalty rate of 3% (2% for MN company)
- Royalty free for first \$1M in sales

**Learn more**

The license includes these two technologies:

### Nanoparticles Functionalized with Organic Molecules

A novel gas phase method and apparatus effectively grafts organic molecules onto silicon nanocrystals to form a passivation layer. The process produces grafted Group IV nanoparticles quickly, at room temperature and with minimal particle aggregation and diffusional losses. The plasma-treated particles are readily soluble in various nonpolar solvents.

### High-Yield Plasma Synthesis of Luminescent Silicon Nanocrystals

A single-step continuous flow non-thermal plasma process produces luminescent silicon nanocrystals. The nanocrystals, which range between 2 and 8 nm, can be produced within milliseconds. The process involves passing an argon-silane (SiH<sub>4</sub>) precursor gas mixture through a quartz reactor tube upon which radio-frequency power is applied through copper ring electrodes, generating a radiofrequency (RF) plasma. The nanocrystals created in this unique plasma environment are collected downstream from the plasma and produce consistent, desirable yields, easily scalable through parallelizing.