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Plasma Synthesis of Nanocrystals

Technology ID
z07107

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

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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.

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

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_4) 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.