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(54) Title: SILICON/GERMANIUM NANOPARTICLE INKS, LASER PYROLYSIS REACTORS FOR THE SYNTHESIS OF NANOPARTICLES AND ASSOCIATED METHODS

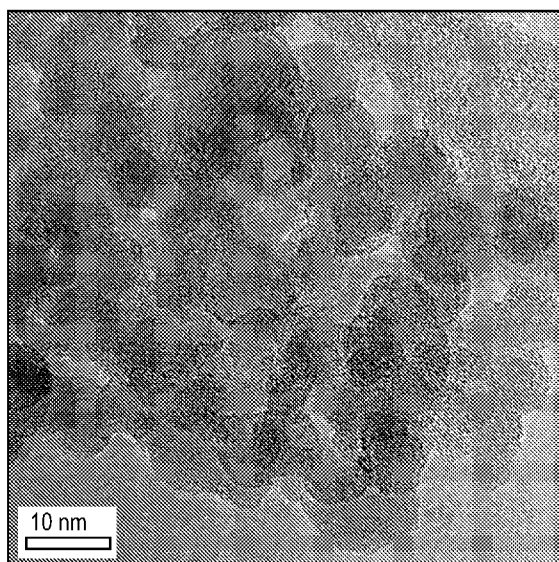


FIG. 20

(57) Abstract: Laser pyrolysis reactor designs and corre-
 sponding reactant inlet nozzles are described to provide
 desirable particle quenching that is particularly suitable for
 the synthesis of elemental silicon particles. In particular,
 the nozzles can have a design to encourage nucleation and
 quenching with inert gas based on a significant flow of in-
 ert gas surrounding the reactant precursor flow and with a
 large inert entrainment flow effectively surrounding the re-
 actant precursor and quench gas flows. Improved silicon
 nanoparticle inks are described that has silicon nanoparti-
 cles without any surface modification with organic com-
 pounds. The silicon ink properties can be engineered for
 particular printing applications, such as inkjet printing,
 gravure printing or screen printing. Appropriate processing
 methods are described to provide flexibility for ink designs
 without surface modifying the silicon nanoparticles.



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