Design and development of Nanomaterial's Using Induction Plasma System and its applications

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Abstract

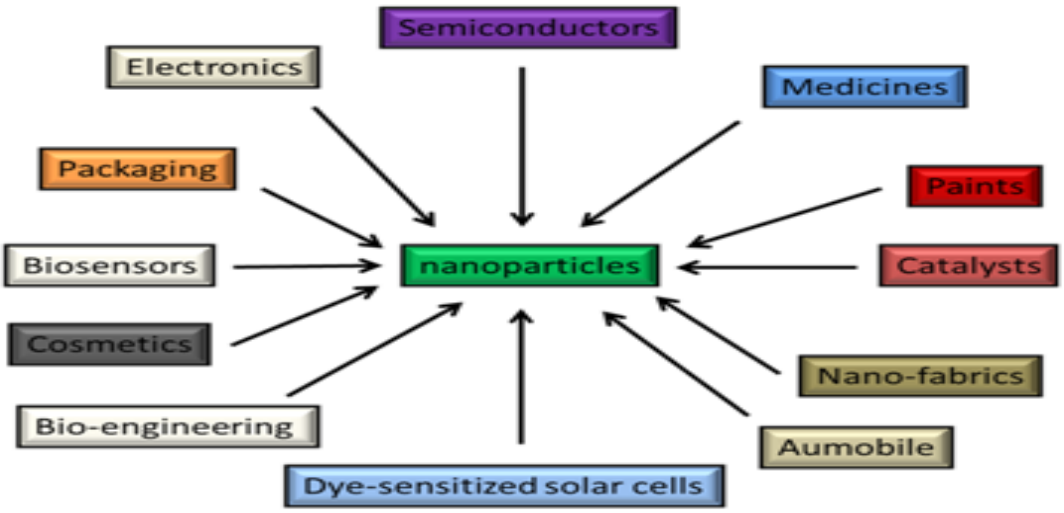
Induction plasma technology (IPS) is the new way of producing high purity nano-powders at an industrial scale, all this made possible by TEKNA Company, the leading producer of nanomaterial synthesizing machines. Not only being a means of producing high purity powders, IPS is known for having a clean heat source which lacks induced contaminants assuring high grade products. This complex technology is based on utilizing high voltage being passed through a coil with a conductor placed in between the coil to produce high amount of heat at the conductor due to the effect of electromagnetic induction. With flowing gas being used as the conductor, it will reach high temperature extremes due to ionization or the gas into a plasma. The most common gases used in this system include Argon, Hydrogen and Oxygen as carriers.

The IPS machine uses micron sized powders as the feed which is then carried carried through the system by a carrier gas commonly being Argon which are then together heated up to extreme temperatures producing ionized metal oxides which are then subjected to a quenching gas which ensures homogenous nucleation. Several parameters are to be closely calculated and followed to ensure the desired nanoparticle size outcome. These include:

- Temperature
- Feed dispersion
- Gas composition
- Quenching gas
- Feed rate
- Carrier gas
- Feed rate
- Carrier gas temperature
- Torch temperature
- Raw material

Extensive research in induction plasma has made the technology better and more efficient than ever before in synthesis of nanomaterials.

Applications



Reference Publications

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Biography

Vignesh N has majored in the field of nanotechnology specializing in design and development of nanomaterials. Based on this background he is now involved in the research and development work of multiple products which are based on nanotechnology. Backed by dozens of trials, his perseverance finally paid off as he was able to tailor specific experimental parameters for several nanomaterials which have already made their way to the market. With this research work, it is paving the way for a future with nanotechnology in it.

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Notes/Comments:

- The paper was co-written by Vignesh N and Justin C.
- The designated speaker would be Vignesh N.