Metallic Coating and Circuit Masking Using Nanoparticles

UA ID Technology #ua14-005

Invention

This invention to cover metals, silica, or glass in a thin metal layer by disclosing the formation of a thin layer of metal from metal (i.e. copper, gold, silver, etc) nanoparticles by only the electrostatic interaction between the nanoparticles and a suitably prepared substrate surface.

Background

Electrostatic plating of metal nanoparticles allows for a method of coating both metal and non-traditional substrates such as but not limited to glass and fused silica, and removes the need for an applied voltage in electro-plating of metals. Thus, insulator materials such as ceramics or polymers may be coated inexpensively with a thin layer of metal without the need for an applied voltage. However, this technique does not currently exist.

Application

• Cheaply and quickly coat metallic and non-metallic materials without the need for electroplating
• Used to coat insulating materials such as ceramics
• Strengthen materials like silica and glass

Advantages:

• Invention improves on electroplating by removing the need for an applied voltage during the electroplating process;
• Invention improves on state-of-the-art electroless plating via the removal of a seed layer;
• The invention makes use of nanometer scale metallic particles;
• Film formed covers silica-monolayer surface without voids including wafer vias and trenches.

Inventors

Dr Anthony Muscat
Dr. Lance Hubbard

Contact

roberts@tla.arizona.edu
(520) 626-4604
Contact

Robert Sleeper
Licensing Manager, Tech Launch Arizona

RobertS@tla.arizona.edu

O: 520-626-4604

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Inventors

Lance Hubbard
Graduate Assistant, Chemical & Environmental Engineering

Anthony Muscat
Dept Chair/Professor, Chemical & Environmental Engineering