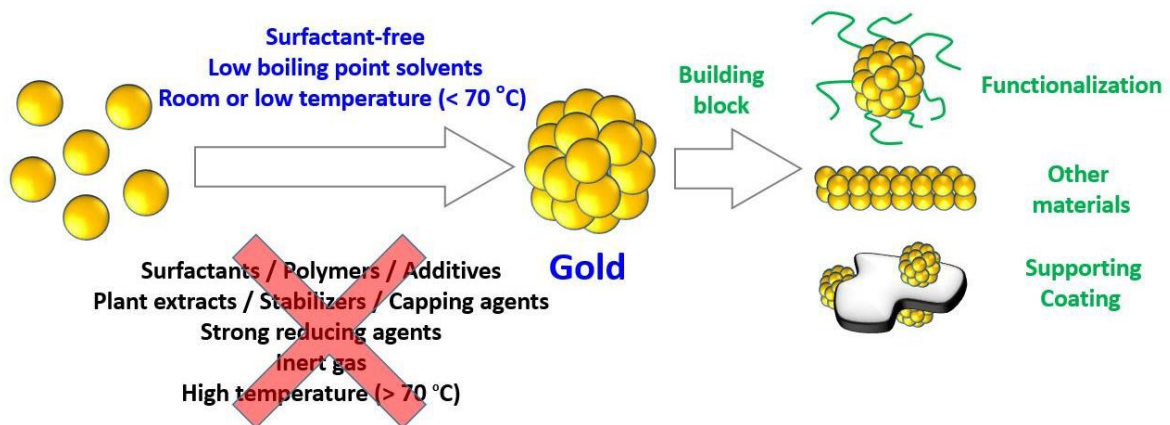




2Gold2Go

Simple, cost and energy efficient production of gold nanomaterials



Background

In the prior art, the preparation of Au nanomaterials is achieved by physical or chemical methods. Physical methods such as sputtering, coating, plasma treatment, ball milling, laser ablation etc. often suffer the drawback to require specific infrastructures and typically require energy consuming processes like high temperature. Chemical methods typically comprise the reduction of a gold precursor in a liquid or supercritical solvent, in the presence of a reducing agent and various surfactants, additives, and/or stabilizers. In some instances, chemical species play the multiple roles of both solvent and/or reducing agent and/or surfactants. In chemical methods, surfactants are used to avoid the undesirable agglomeration of the nanomaterials. However, the presence of surfactants or residual surfactants reduces the available surface area of the nanomaterials which is detrimental to unlocking the full potential of the nanomaterials.

The invention

The proposed innovation is directed at methods for preparing surfactant-free Au-based nanomaterials, such as nanoparticles with size control to overcome the above-identified disadvantages and limitations and which allow in an easy, efficient and reliable way to produce Au-based nanomaterials, in particular those which provide unexpected advantages over nanoparticles prepared according to traditional methods.

Key selling points

The method only requires:

- few, safe and cheap chemicals
- Safe and cheap solvents (low boiling point mono-alcohols and water)

This approach requires:

- **No** hazardous reducing agents
- **No** surfactants, additives, polymers, DNA, plant extract or other stabilizers

Development status

Detailed control of the synthesis parameters and their influence. Size control in the range 5-30 nm using mixtures of mono-alcohols and water. Scaling up to 1 L of solution / 100 mg of Au. Suitable for multi-metallic nanomaterials comprising gold.

TRL: 4 -including controlled reproducibility and scaling up.

Future work: further scaling up.

Intellectual property rights

Priority application filled August 2021: *Surfactant-free colloidal synthesis of gold-based nanoparticles*
European patent application nr.: 21193770.1

