# Article information:

Synthesis of Bimetallic Au@Pt Nanoparticles with Au Core and Nanostructured Pt Shell toward Highly Active Electrocatalysts | Chemistry of Materials
<https://pubs.acs.org/doi/abs/10.1021/cm102074w>

# Article summary:

1. Bimetallic Au@Pt nanoparticles with a nanostructured Pt shell were synthesized through chemical reduction of H2PtCl6 and HAuCl4 in the presence of a low-concentration surfactant solution.

2. The difference in reduction potentials of the two soluble metal salts played a key role in the one-step synthesis of the core-shell structure, with Au ions reducing first to form Au seeds followed by overgrowth of Pt nanodendritic nanowires on the Au seeds.

3. The thicknesses of the Pt shell on Au cores can be easily tuned by controlling the Pt/Au molar ratios in the starting precursor solutions, and optimization of these thicknesses leads to enhanced activity as an electrocatalyst for methanol oxidation reactions.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

The article titled "Synthesis of Bimetallic Au@Pt Nanoparticles with Au Core and Nanostructured Pt Shell toward Highly Active Electrocatalysts" published in Chemistry of Materials describes the successful synthesis of Au@Pt nanocolloids with nanostructured dendritic Pt shells. The authors explain that the difference in reduction potentials of the two soluble metal salts (Au(III) and Pt(IV) species) plays a key role in the one-step synthesis of the core-shell structure. The reduction of Au ions preferentially occurs over a short time to form the Au seeds, followed by overgrowth of Pt nanodendritic nanowires on the Au seeds.

The article provides detailed information about the synthesis process, including how ultrasonic treatment can dramatically decrease particle size and narrow size distribution. The authors also note that Pt shell thicknesses on Au cores can be easily tuned by controlling the Pt/Au molar ratios in the starting precursor solutions.

One potential bias in this article is its focus on promoting the use of these bimetallic nanoparticles as highly active electrocatalysts for methanol oxidation reactions. While this is certainly an important application, it may overshadow other potential uses or drawbacks associated with these nanoparticles.

Additionally, while the article does provide evidence for their claims regarding the synthesis process and electrocatalytic activity, there are some missing points of consideration. For example, there is no discussion about any potential environmental or health risks associated with using these nanoparticles.

Overall, while this article provides valuable insights into the synthesis and potential applications of bimetallic Au@Pt nanoparticles, readers should approach it with a critical eye and consider any potential biases or missing information.

# Topics for further research:

* Environmental risks of using bimetallic nanoparticles
* Health hazards associated with Au@Pt nanoparticles
* Alternative applications of Au@Pt nanoparticles
* Limitations of using Au@Pt nanoparticles as electrocatalysts
* Synthesis methods for other types of core-shell nanoparticles
* Comparison of Au@Pt nanoparticles with other electrocatalysts for methanol oxidation reactions

# Report location:

<https://www.fullpicture.app/item/0d9a1b240f1db7b6beab81ab9ff108e0>