



# Diffusion and segregation kinetics in immiscible metallic nanoalloys Au-Pt

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# Au-Pt nanoparticles:

can catalyze

- alcohols oxidation;
- alkane conversion;
- NO reduction;
- C-N coupling;
- Oxidation of glucose ...

*J. Phys. Chem. C* 2009, 113, 3, 849-855,  
Publication Date: December 31, 2008

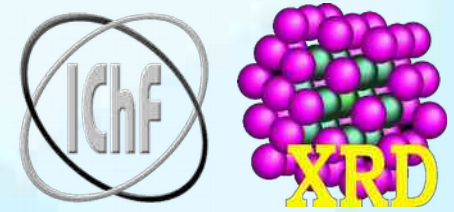
as potent antibiotic reagent;

*Angewandte Chemie, Volume 53, Issue 31,*  
July 28, 2014; Pages 8127-8131

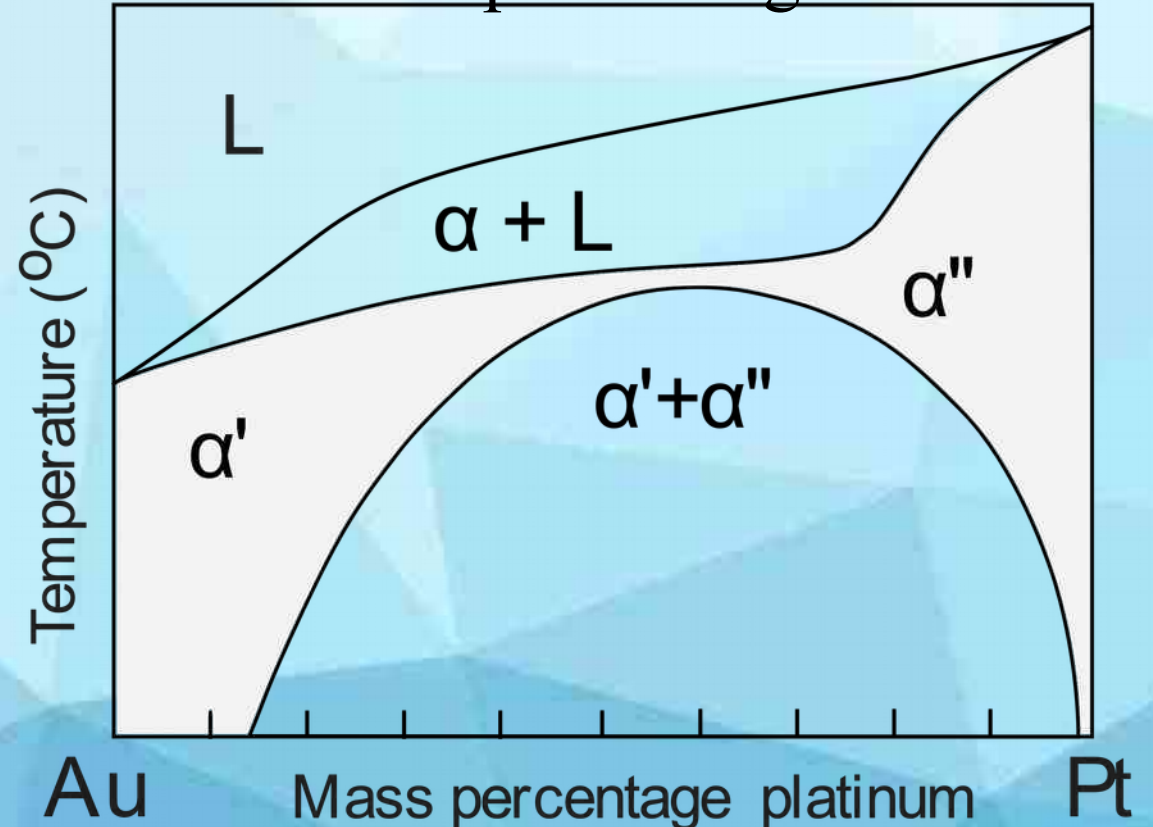
as catalyst in fuel cells:

[https://www.nasa.gov/centers/glenn/shuttlestation/fuel\\_cell.html](https://www.nasa.gov/centers/glenn/shuttlestation/fuel_cell.html)

Problem:



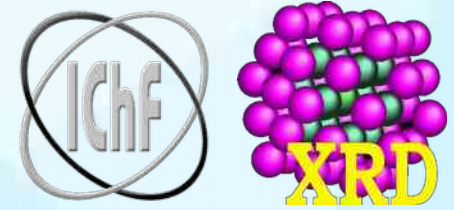
Au-Pt phase diagram



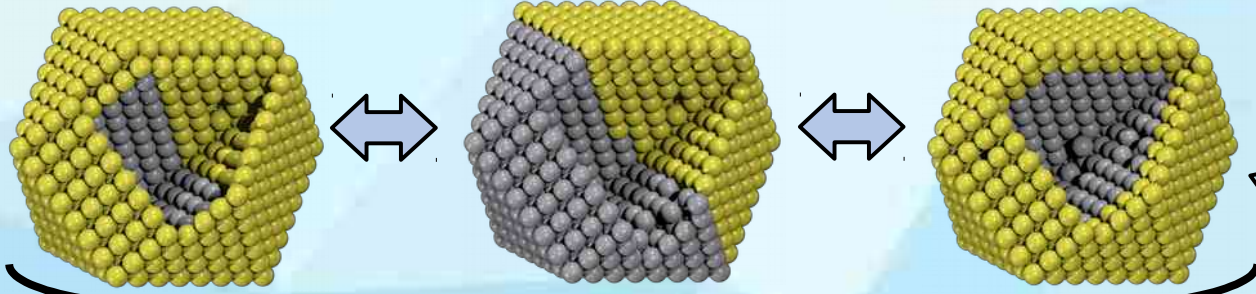
*J. Electrochem. Soc.* 2008 volume 155, issue 8, B852-B859

What does it mean?

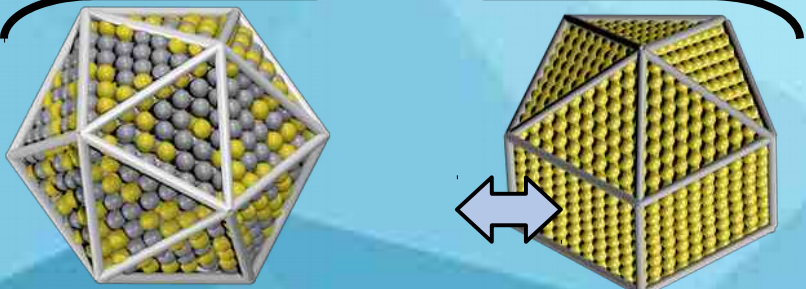
# Structure transformations:



Cubooctahedron crystals  
Onion-like      Janus      Core-shell



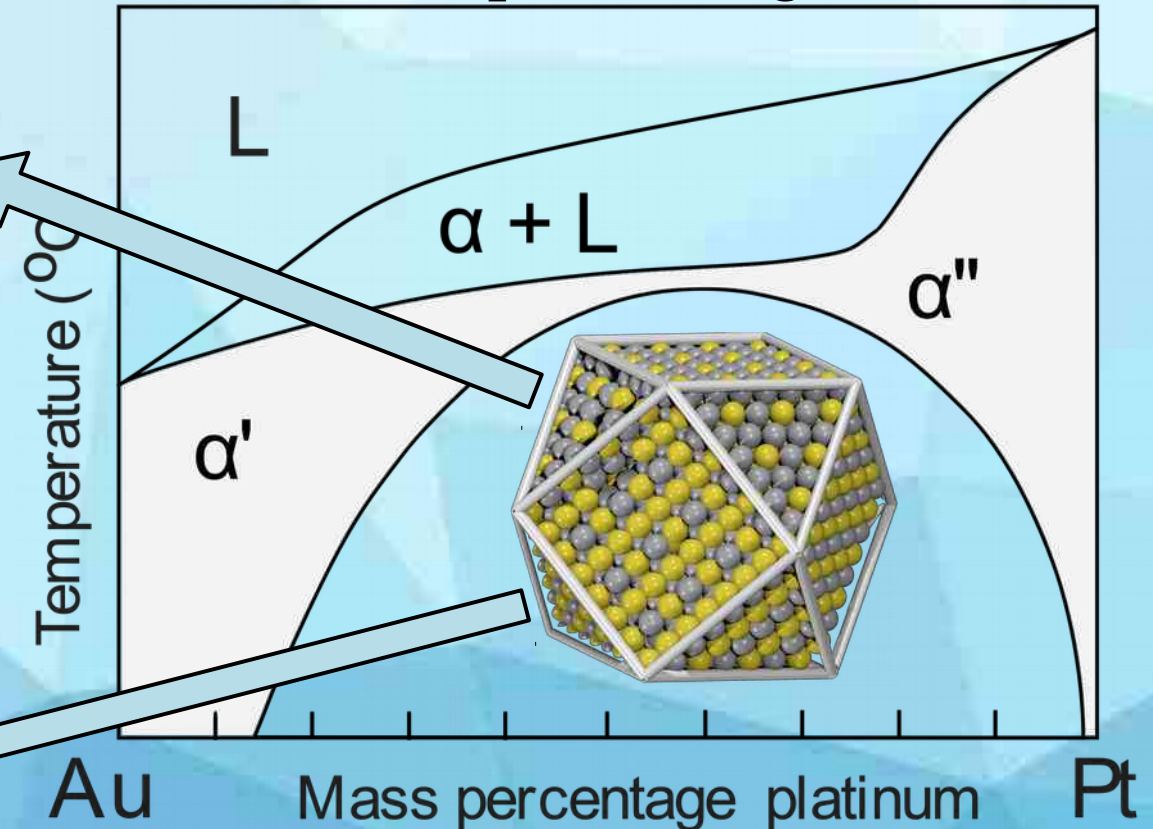
Different structure =>  
Different properties !



Icosahedron      Decahedron

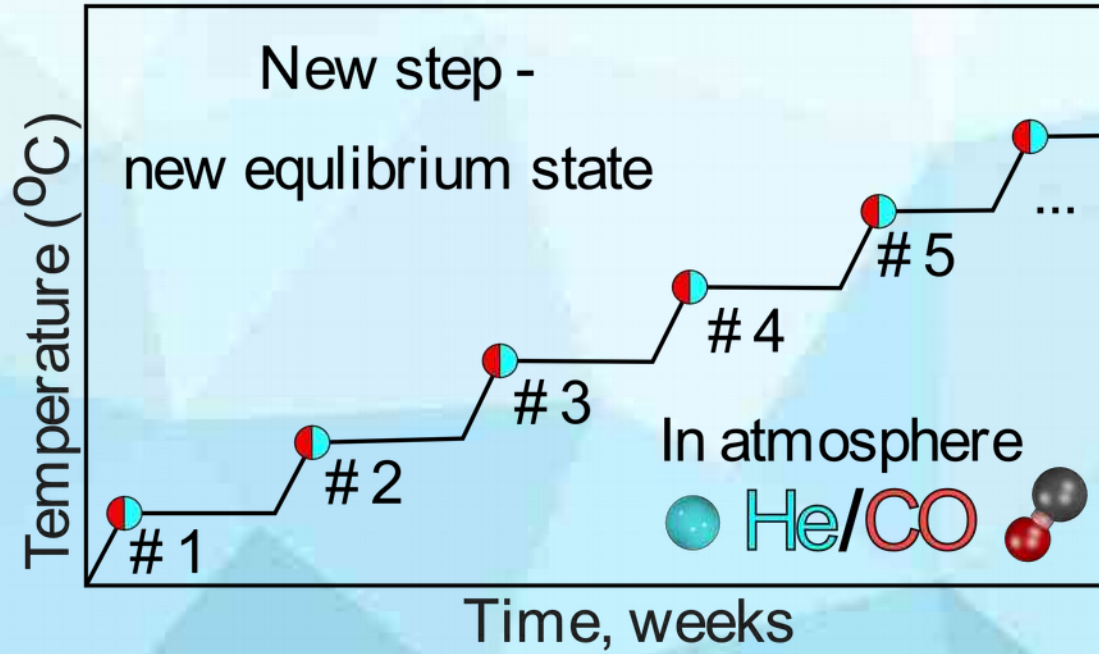
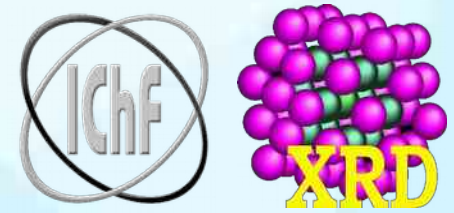
*J. Phys. Chem. C* 2012, 116, 19, 10814-10818

Au-Pt phase diagram



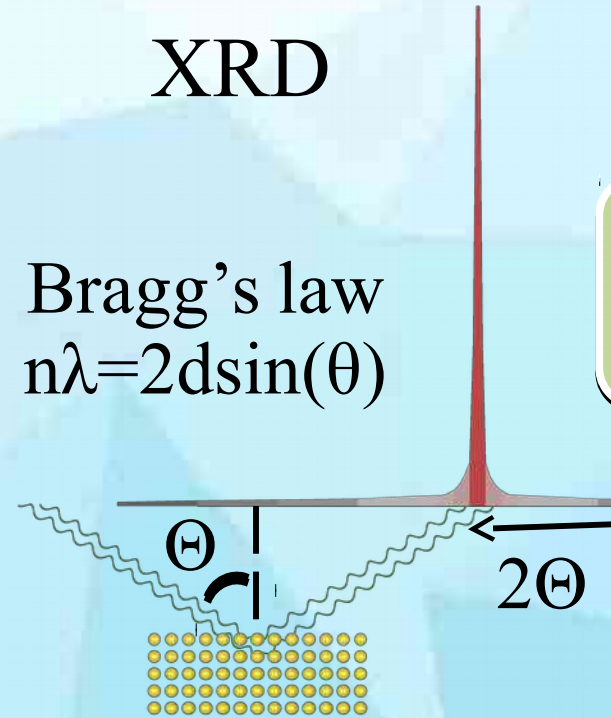
How can we detect  
these transformations?

# Our strategy:

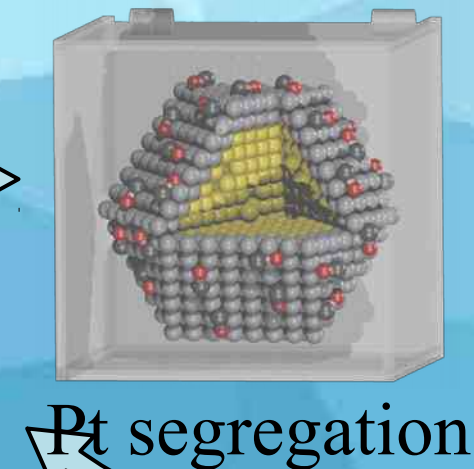
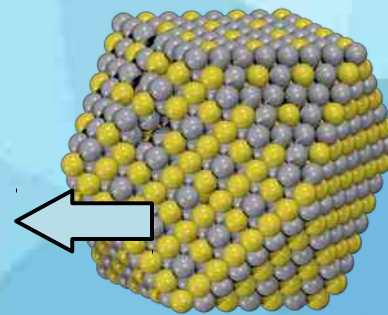
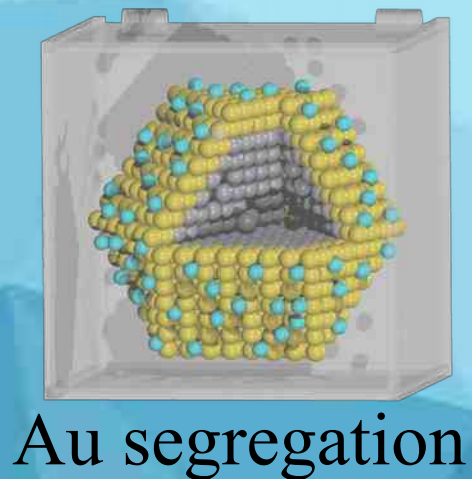


XRD

Bragg's law  
 $n\lambda = 2d\sin(\theta)$



ex-situ XRD  
in-situ XRD



# Our AuPt@SiO<sub>2</sub> nanoparticles:

