

**Health Effects Institute**  
**ANNUAL CONFERENCE**  
 April 15 - 17, 2007  
 Chicago, IL

**Session: Ambient and Engineered Nanoparticles**

**Günter Oberdörster**  
 University of Rochester  
 Rochester, New York

**Deposition and Biological Effects of Nanoparticles**  
 April 16, 2007

**GOLD COLLOID**

**Ancient times:** for staining glass and medicinal purposes

**Modern times:** Paracelsus (1493-1541) prepared **"Aurum Potabile"**


as all purpose medicine:  
 — clears the mind  
 — increases intelligence and willpower  
 — balances emotions, etc.

Michael Faraday (1857) started scientific evaluation of "activated gold" in pure state

Offered today as an alchemically significant sacramental solution:  
 — mean gold particle size 1.4 nm  
 — to enhance meditation  
 — increase flow of *chi* in the body  
 — no documented side effects  
 — 5 ml to 15 ml three times a day



**Nanoparticles as Health Supplements (5-30 ppm)**

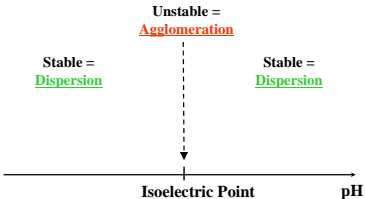


... and MESOIRIDIUM... MESOTITANIUM ... MESOZINC

Daily doses: 5 - 15 ml

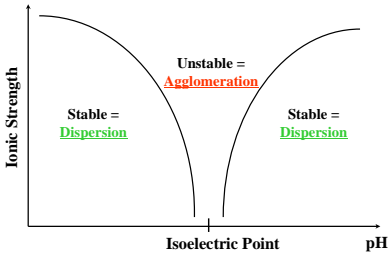
<http://www.purestcolloids.com/index.htm>

**COLLOID STABILITY MAP IN LIQUID MEDIUM**



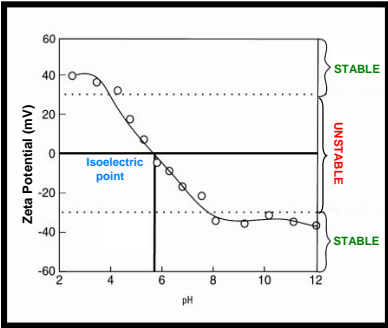
Based on Rector and Bunker, 1995

**COLLOID STABILITY MAP IN LIQUID MEDIUM**



Based on Rector and Bunker, 1995

**Agglomeration State of Nanoparticles (NP) in Fluids**



- more alkali in suspension → more negative NP charge
- more acid in suspension → more positive NP charge
- zeta potential between -30 mV to +30 mV → unstable suspension, agglomeration of NP
- isoelectric point = zero zeta potential → highest agglomeration of NP
- zeta potential < -30 mV or > +30 mV → stable suspension, best dispersion of NP

<http://www.silver-colloids.com/Tutorials/Intro/pcs18A.html>

