

The background of the slide features a repeating pattern of light green hexagons on a darker green gradient. A white rectangular box is positioned on the right side of the slide, containing the title and subtitle. The top portion of this box is a solid dark grey color.

Mixtures

Solutions, Colloids and
Suspensions

Solutions

- Homogeneous mixtures
- Solute and solvent are evenly distributed throughout
- Typical solute particle size: $< 1\text{nm}$
- Particles are too small to filter out
- Solutions do not separate upon standing

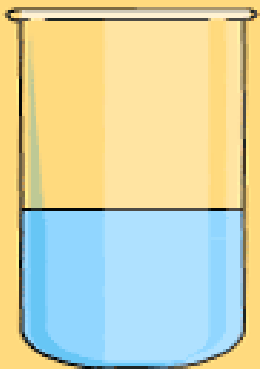
Suspensions are heterogeneous mixtures

- Examples of suspensions
 - Clay in water
 - Muddy water

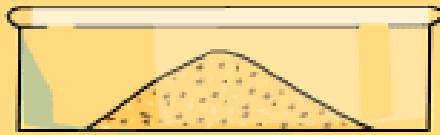


Suspensions

- Heterogeneous mixtures
- Particles settle to bottom when undisturbed



WATER



SAND



SUSPENSION

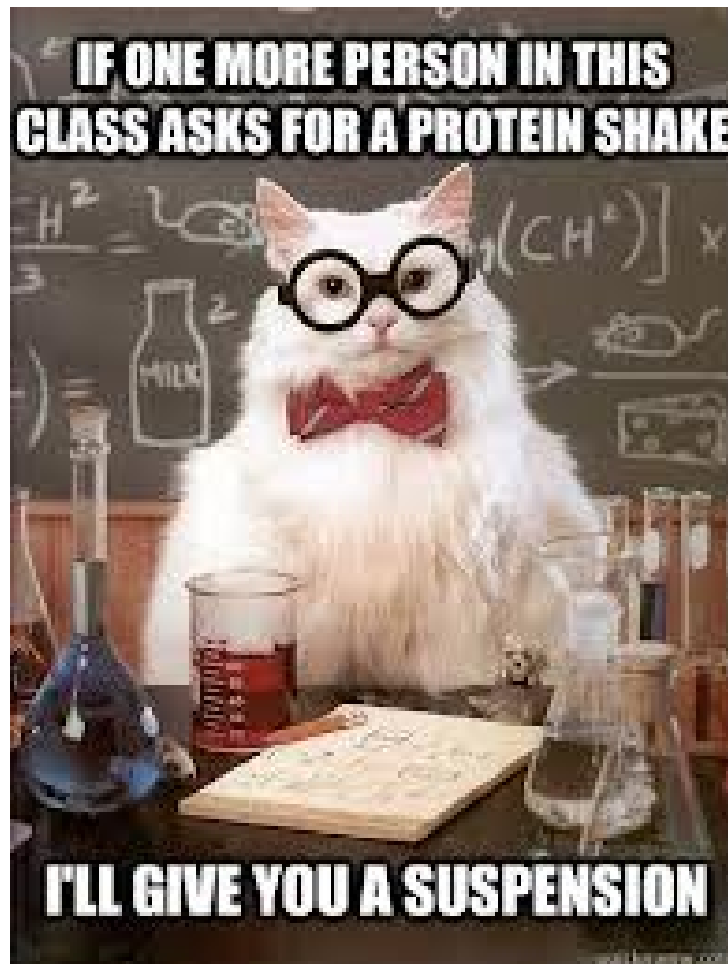
The mixture still has undissolved solid particles settled at the bottom, with some particles still floating

Suspensions



- Particles can be recovered by filtration
- Particle solute diameters typically 100-1000 nm

Chemistry cat says...



Ink

- Really a suspension of finely ground pigment particles in a liquid
- Polymer-water mixtures
- Polymers link together and solidify when exposed to air



Ink pigments

Yellow ink PbCrO_4

Red ink CdSe

Blue ink $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$

White ink TiO_2

Colloids

- May be milky or cloudy in appearance
- Don't separate on standing
- Can't recover particles by filtration
- Typical solute particle diameter 1-100 nm

Examples of colloids

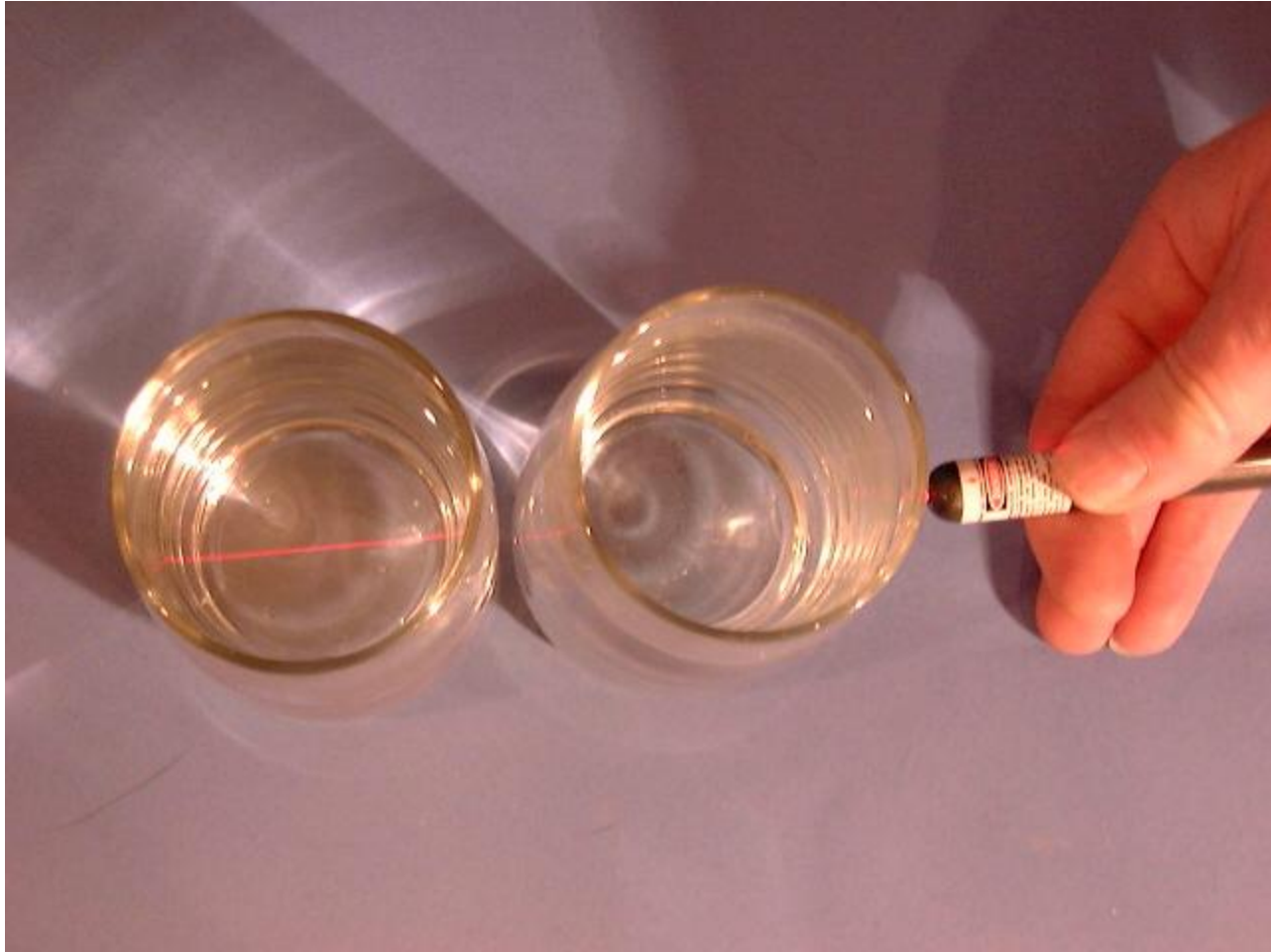


Tyndall Effect

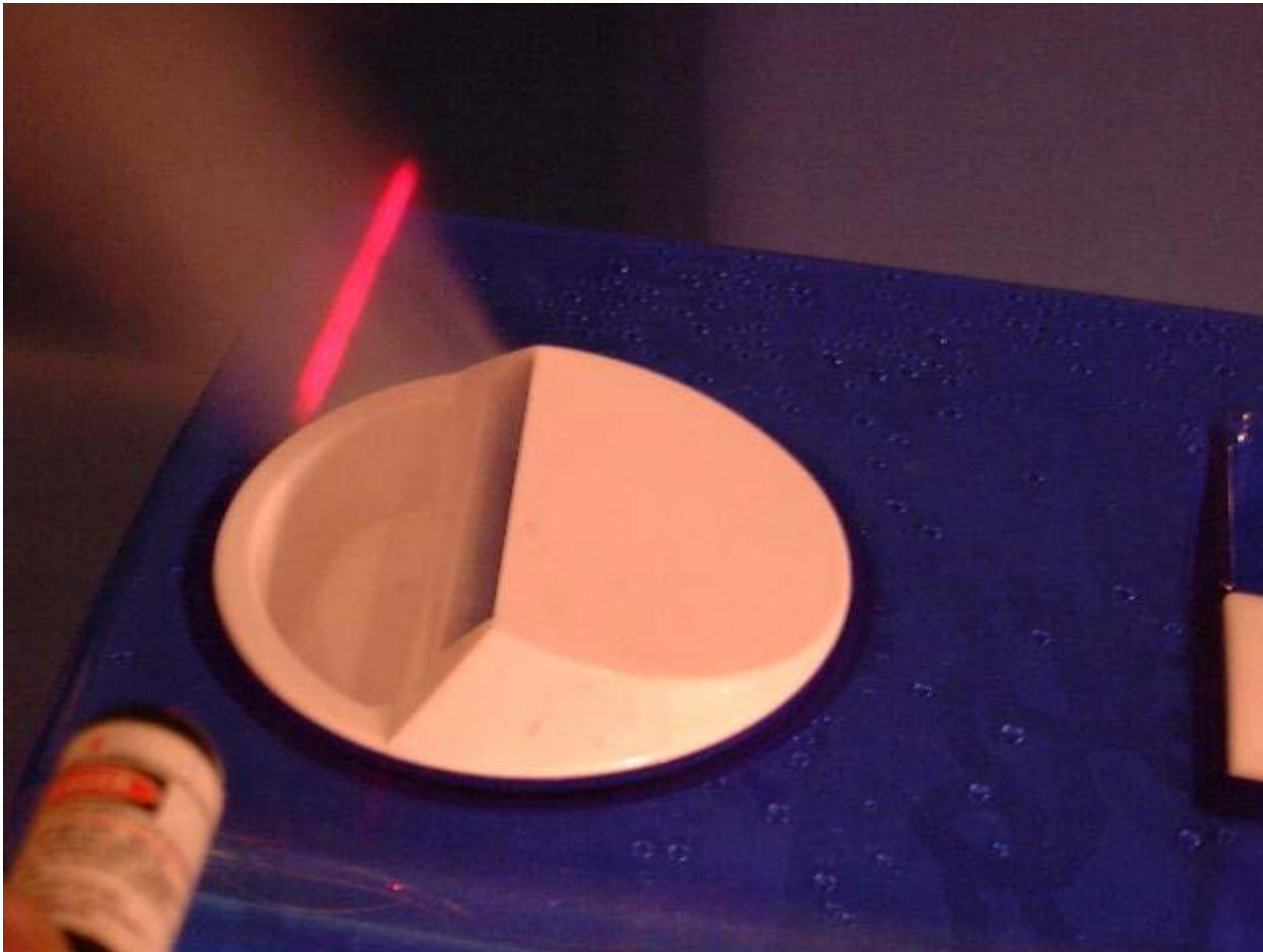
- Suspensions and colloids scatter light beams, making them visible
- Observed when high beams are used in a heavy fog



Tyndall Effect



Tyndall effect



Colloidal Silver

- Suspension of submicroscopic metallic silver particles in a colloidal base.
- Long-term use of silver preparations can lead to argyria, a condition in which silver salts deposit in the skin, eyes, and internal organs, and the skin turns ashen-gray.
- Amount of silver needed to cause argyria is unknown

<http://www.quackwatch.org/01QuackeryRelatedTopics/PhonyAds/silverad.html>)

Stan Jones

- Former Senate candidate from Montana
- Began consuming his own colloidal silver concoction out of fear that Y2K would disrupt antibiotic supply



Got it?

- You are given three beakers containing unknown mixtures. Create a flow chart showing the steps you would follow to determine whether the beakers contain a solution, a suspension, or a colloid.