**Required Training**

UC Lab Safety Fundamentals

**Required PPE**

Lab coat, safety glasses/goggles, nitrile gloves

**Equipment**

3 opaque cups

**Chemicals**

Sodium Polyacrylate

1 transparent smaller cup

**Procedure:**

1. To be done out-of-sight: Measure 10 g of sodium polyacrylate and place it in the transparent cup. Place the transparent cup in one of the opaque cups.

2. Pour 50 mL DI water into an opaque without the polyacrylate in it. Perform the swapping cup magic trick. Ask audience to pick the cup with water.

3. Pour the water into the cup with polyacrylate in it and perform the swapping cup trick again. Ask audience to pick the cup with water. Tip over every cup (should have solidified) to show no water. Remove inner transparents cup with polyacrylate in it to show off.

4. For a longer demonstration wait to pour water into polyacrylate until last cup.

**Clean-up:** Keep and dry the opaque cups. Clean out the transparent cup with each use (dispose of polymerized polyacrylate in trash).

**Hazards:** Sodium polyacrylate is non-toxic, but is a class 2A eye irritant so caution when handling the loose powder.

**Principle:** Sodium polyacrylate is a polymer made of long chains of repeated acrylic acid subunits. In its powder form (dry) the positively charged sodium ions are tightly bound within a cage of polyacrylate, kept close by negatively charged carboxyl groups from the polymer backbone. By adding in water, the sodium ions are “replaced” by the positive hydrogen ions of water, resulting in the unraveling of the tightly organized polymer chains. The chains do not separate, so polymerization is maintained, but a stiff gel forms.
Notes: Sodium polyacrylate is reported to absorb 100-1000x its own weight in water.