

## NCW 2008 – Having a Ball with Chemistry

### Hands-on Demo Script Addendum – October 5, 2008

- This addendum is additional information to go along with the scripts which were PRINTED and distributed with our hands-on-demonstration kit boxes.
- Minor typos are not listed here.
- An updated version of the script with all typos and additional information gathered since our ‘Dress Rehearsal’ will be put on the website at a later date.
- **IMPORTANT items will be listed in bold print**

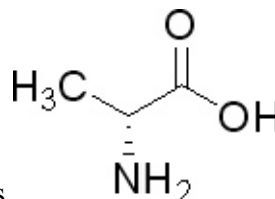
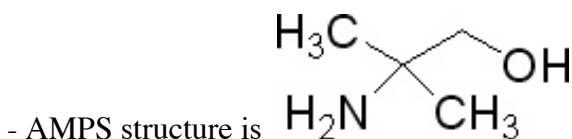
#### Clean Up:

- **IMPORTANT – If you have leftover AMPS polymer, throw it into the solid waste trash during clean-up; do NOT put it into the sink. Better yet, mix it in a cup with some Elmers glue to make a non-reactive polymer complex and then add it to the solid waste.**

Page 4: Correction: Activities to do before the day of the program:

- The Supply list starts on page 7

#### Expt 1



For reference, the amino acid alanine is

- Clarification: Our experiment discusses the physical activity of the children lining up (as individual monomers), linking arms to form two lines (which represent two linear polymer structures), and then finally forming cross-links with other children holding the two lines together. Our description later, after the ‘rubber’ balls are made, may not be ‘exact’ with our use of the term monomer. Amps is indeed a monomer, but in our experiment to make a ball we do not form linear polymers that later crosslink. Instead, amps itself has the ability to form the crosslink structure.

#### Expt 2 – Sports drinks

- The amount of sugar in the provided zip-lock bag does match the amount of sugar in the gatoraide bottle of the size provided in the kit box.

- Please stress that that really is the amount of sugar in the bottle of Gatoraide supplied. Most children do not realize just how much sugar they ingest when drinking a “sports” drink and other soda/pop beverages.
- Please also stress that the bottle contains 2.5 servings, so if you drink the whole thing, you get a lot of sugar: 2.5 times the amount listed on the label.
- Correction: The separate nutrition labels provided are wrong. There are 2.5 servings in our provided bottle, not 4.

### Expt 3 – Grass chromatography

- The alcohol can evaporate in time. Choose to either distribute the alcohol to the cups during the demo OR cover the cups with small sheets of paper to prevent evaporation.

### Expt. 4 – Surface tension

- ‘Skin’ is not a good term for surface tension; use “interlock” such as from expt 1, and use the term “hydrogen bonding” H-O-H ...O-H<sub>2</sub>
- When you add soap, fewer hydrogen bonds can form and thus there is less interlocking of water molecules and less surface tension. The soap and ‘dirt’ and stains can thus interact more efficiently.
- Depending on if the students hold the pipet straight up versus at an angle, they can ‘stack’ fewer or more droplets on the penny because the size of the droplet varies depending on how they hold the pipet. If they hold the pipet straight when they drop the pure water, then they should also hold it straight when they drop the soapy water to make an accurate comparison.

### Expt 5 – Cleaning clothes

- **Please rinse out your ‘clean water tubes’ prior to their use in the program.** They were used last year and may still have soap residue from the cleaning process. Rinse well prior to your experiments so you do compare water-only to water-with-soap
- **Use either...**
  - **real leaves or grass to make stain on the cloth provided, or**
  - **ONLY 1-2 drops of concentrate on the cloth provided, or**
  - **1-2 drops of concentrate on a strong paper towel**

**The use of more concentrate will saturate the cloth and does not allow the soap to remove enough to show a cleaning difference vs the use of just water.**
- Expt 6 – typos only

### Supplies list

Expt 1 – AMPS is not necessarily needed. There are other cross-linking polymers available.