Monomer Purification

As you know, liquid monomers, such as styrene, can be purified by distillation. Nobody likes distillations; they are hard to set up, take all day, can be dangerous, and by the time a lab student got around to using their distilled monomer, it would probably be wet again. Since nobody wants to distill their monomer, here is a procedure to purify monomer using a simple column.

Preparation of Column

Before packing the column, take the following precautions:

* Make sure your work area is clean
* When working with powders (spceifically aluminum oxide), take care not to inhale the powder
* If the monomer to be purified has been in the refigerator, allow two hours for the monomer to come to room temperature to prevent any additional water absorbtion through condensation.
* Make sure that your monomer will not spontaneously polymerize at room temperature in the absence of initiator.

Now that you have taken the appropriate precautions to ensure that your purification will not introduce more impurities into your monomer, let's pack the column.

1. Take a column and insert cotton fibers into the lower end (stopcock) of the column. This will act as a filter.
2. Pour quartz sand over the cotton until the level of the sand is above the conical part of the column (~1-2 cm), and level the surface by tapping the side of the column with a cork ring.
3. Pour basic aluminum oxide and level the surface.
4. Pour oven dried K2CO3 over the aluminum oxide and level the surface.

Purification

1. Pour the monomer into the column carfully . Let the monomer flow through the column and open the stopcock when the monomer reaches the bottom. Do not apply pressure to the column, because pressure will force the aluminum oxide through the cotton filter.
2. Collect a small amount of monomer in a clean vial to check for aluminum oxide contamination. If the monomer is clear, continue with purification. If the monomer is cloudy, reprepare the column paying special attention to the cotton insertion step.
3. Do not allow the column to dry out during the purification. Keep a constant stream of monomer flowing through the column at all times.
4. Collect your monomer in a clean, dry bottle or flask which can be capped tightly.
5. Generally, impurities and inhibitor stay at the aluminum oxide line and forms a yellow band on the column. If the yellow band moves farther down the column (into the sand), this purification procedure is not suitable for your monomer.
6. Stop collecting purified monomer when the level of the unpurified monomer reaches the top of the K2CO3. Do not collect the monomer which remains in the column.
7. Immediately wash the column by passing a suitable solvent through the column several times.
8. Store the purified monomer in the refigerator under dry nitrogen.