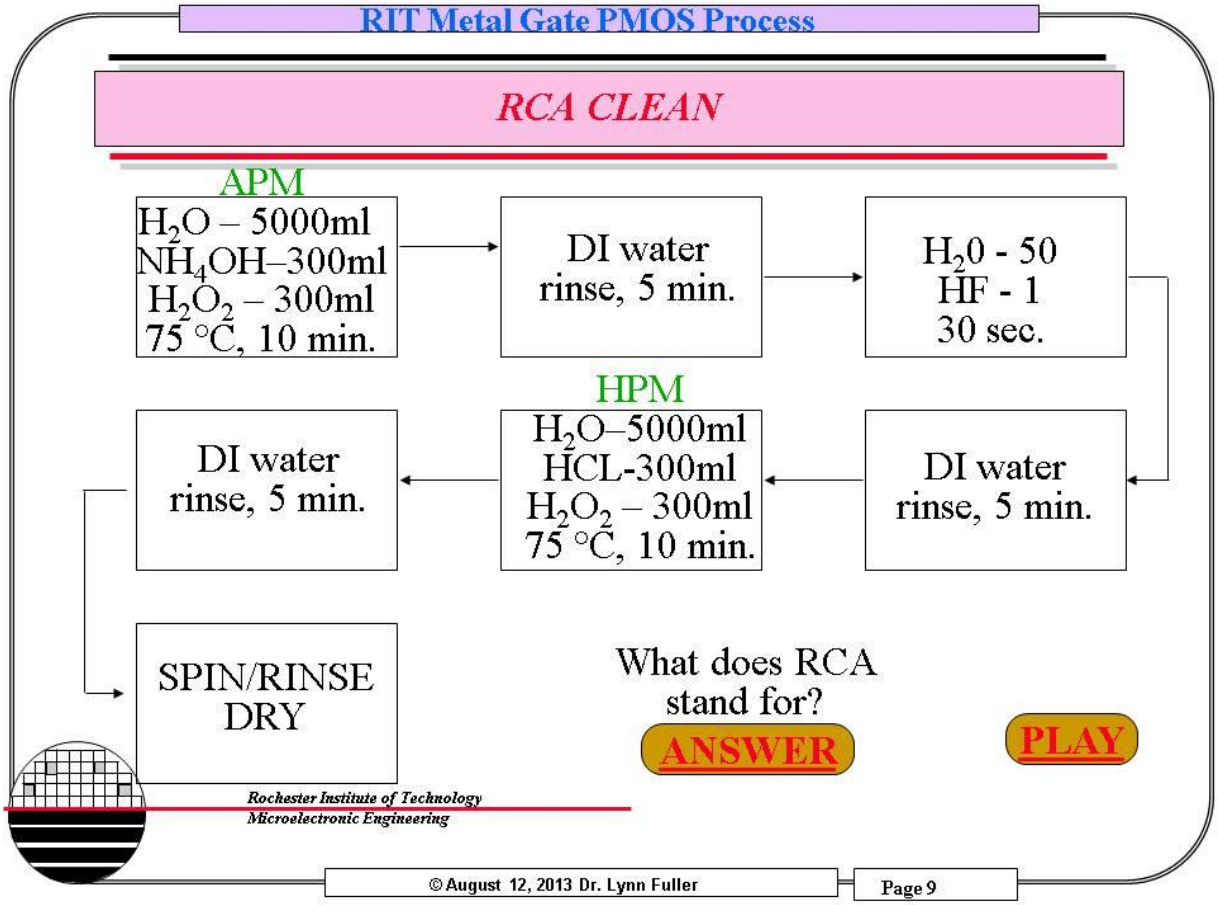
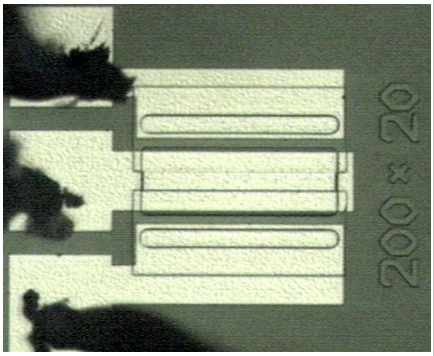
SMFL Users News Letter – Number 130812 V3.2

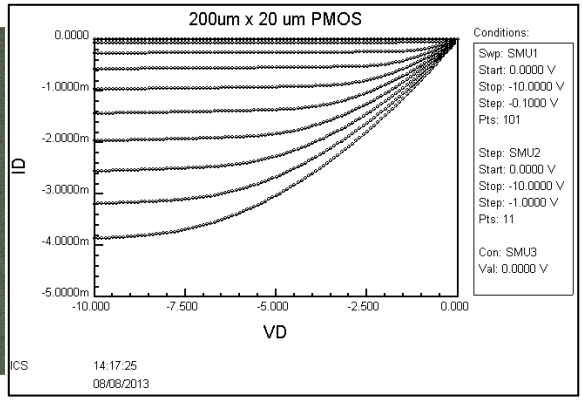
This News Letter is intended to provide information of interest to MicroE faculty and other users of the SMFL. It is a report on equipment and processes used in the SMFL with emphasis on changes, problems, and details that may not be generally available to users. I distribute this to the MicroE faculty and others. If you feel that this News Letter has some information that might be useful to your graduate students please forward it to them. Past newsletters are posted on Dr. Fuller's webpage.

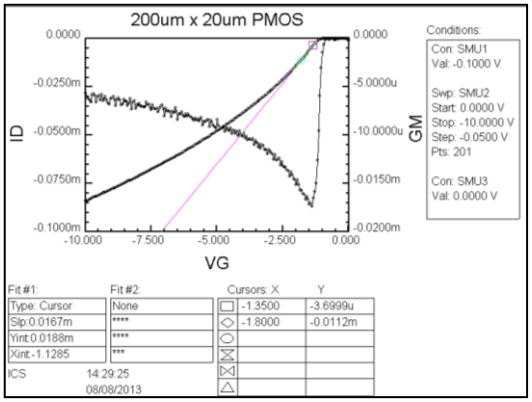
RCA Cleans: We use a lot more hydrogen Peroxide than we need to for our RCA cleans. In SC1 we have a mixture of 1:3:15 which is 300ml Ammonium hydroxide: 900ml of hydrogen peroxide and 4500 ml of DI water. Most other universities use 1:1:15 mixtures. If we switched to 1:1:15 we could save thousands of dollars each year. This summer Celia Sherry, chemistry major from Colgate University, and I investigated our RCA clean. Her complete report is posted on my webpage at http://people.rit.edu/lffeee/newsletters . A summary of her findings follows: H2O2 is necessary to protect exposed silicon from being etched by the strong base in SC1 by creating a chemically grown oxide of approximately 50Å, with no H2O2 in the SC1 bath exposed silicon is etched at approximately 0.5µm per minute, SC2 does not seem to etch exposed silicon with or without H2O2, as little as 100ml of H2O2 will protect one wafer being cleaned in SC1. As a result of our investigation we recommend a new RCA clean procedure as shown below:



We used this clean in our metal gate PMOS process and found that the resulting transistors are as good as any we have made in the past. See below:







Ion Implanter Pick Arm:

The six inch end station on the ion implanter has a new pick arm with a slightly larger rectangular groove for picking up glass wafers shown in the picture below. The groove in the original pick arm for silicon wafers is slightly rounded and sometimes causes chips in the glass wafers which do not have rounded edges. There is a pink slip on the tool that tells the user to ask an equipment engineer to put in the correct pick arm for either glass or silicon wafers. Several people (by accident) have forgotten to get the pick arm changed and used the one for glass when implanting silicon wafers. To date there has been no problems, broken wafers or other issues. I suggest we use the new pick arm for glass wafers for both glass and silicon.