

Nitrate Aerosols And Nitric Acid Vapors In the Air

The intent of this project was to find a simple and manual technique that provided the collection, measurement, and analysis of nitrate/nitrogen oxides in the air/atmosphere. Known versions of various filter pack methods were compiled and used to expound the overall technique. To date the measurements produced by this method are accurate indicators of ozone formation (O₃) in the tropospheric level of our atmosphere.

Daniel Wilson, Computer Science, Jr

Mentor: Dr. Sandip Sen, College of Science & Engineering,
Computer Science Dept, TU

Title: Developing an Automated Distributed Meeting Scheduler

To develop an automated process time scheduling and attending meetings. The theoretical methods used was a distributed approach, by which each person using the application is given his own intelligent agent. These agents communicate with one another over a network to decide upon meeting times. Each agent makes decisions based upon information derived from other agents and from a user-defined set of preferences as to meeting times and invitee priorities. Since the research phase is complete and we are now implementing the program in Java. Naturally, our theoretical preferences are limited by tangible realities of programming and these conflicts are what we are currently dealing with.

Adrian Casias, Engineering, Junior, Drs. W. Pasco and E. Lopez,
Sandia Laboratories, NM 8

"Investigating a New Etching and Polishing Process for the Large Flange and Associated Parts in the Production of the MC4277 Neutron Tubes"

The Large Flange (Accelerator) of the MC4277 Neutron Tube lies in a high-energy electric field during tube operations. Due to recent poor tube operations, the etching and polishing process is being reevaluated due to breakdowns around the Large Flange. The breakdowns are believed to be caused by a non-uniform surface meaning burrs, needles, or rough spots that act as micro lightning rods in this high-energy electric field. Particles from the polishing paste on the surface and embedded in the flange and the roughness of the flange itself after the polishing process are probably the sources of these electric field breakdowns. To correct these problems, several processes are being evaluated in parallel. Two of these processes being explored use a new electropolishing process and a new rigid sanding polishing process using a lathe with mechanical sanding and polishing methods. These two new processes should minimize operation time, improve quality, lessen the labor intensity, and be more consistent processes so that less breakdown occurs around the Large Flange.

LaTasha Vick, Biochemistry Senior, Dr. Edward Collins, Dept
Micro/Immuno, University of North Carolina Design and development of immune therapeutics.

- Conducted research on protein 39, which is involved in immune defense
- Mutated plasmid DNA by annealing 4 mutagenic primers
- Analyzed the plasmid/protein response to the mutation
- Suggested that 1 of the 4 mutagenic primers resulted in a lethal/functional gene