North Texas Section Focuses on Forensics and Electronic Materials

The North Texas Materials Characterization Society has focused on truly diverse multidisciplinary topics recently—forensic materials analysis at its April meeting and electronic materials and the scanning tunneling microscope in its June activities.

April Meeting

Approximately 40 persons attended the April 11, 1988 meeting of the North Texas Materials Characterization Society at the OBOK China Restaurant in Garland, Texas. Restaurant owner Sun Hwouk Wi again outdid himself in providing a sumptuous dinner, and featured speaker Alan B. Weckerling of Weckerling Scientific Laboratories, Inc. did an excellent job of describing another side of "Quincy type" forensic science—the combination of scanning electron microscopy and basic science to solve cases ranging from accidents at the job site to fire origins, auto accidents, and why chicken coops rust. Or as Weckerling blithely put it, "From the world of sue-the-SOB comes the hired gun from the lab."

Weckerling related four case histories of litigation, typical of the scanning electron microscopy work Weckerling Scientific Laboratories provides, which were presented to the American Academy of Forensic Science:

- A coffee maker left in the on position caused a ruinous fire. SEM was used to demonstrate that a welding condition in the thermostat would result in the plastic around the heating plate catching on fire in less than 10 minutes.
- A major New York City office build had problems maintaining a proper temperature. SEM analysis revealed that certain sensitive devices were being contaminated with oil. Mandatory oil filters to the compressed air lines were being deliberately bypassed. Scanning electron micrographs finally convinced all parties of the necessity to install oil traps before all controllers.
- A fire with multiple fatalities was incorrectly identified by a metallurgical laboratory as being caused by two cracked diodes "shorting out" and catching the plastic cover of a computer printer on fire. SEM/EDS examination of the plastic cover proved that the plastic contained bromine, a fire retardant addition. In fact, the plastic would not burn when placed directly on a hot stove.
- A manufacturer of multiwire printed circuit boards experienced severe delamination of his product. Failure analysis with the SEM proved that the delamination was occurring within a single layer, the adhesive layer. Examination of the raw adhesive sheets revealed that they were manufactured in two layers, not an approved method.

June Activities

The June 6, 1988 meeting of the North Texas Materials Characterization Society was held in conjunction with the Seventh Annual Joint Symposium on Electronic Materials, Processing, and Characterization. The symposium was a combined effort of the local chapters of the American Vacuum Society, the Electrochemical Society, and the Materials Research Society. Held at the Marriott Park Central Hotel in Dallas, the symposium hosted about 130 attendees and 35 exhibitors. [Details of the joint symposium will be published in an upcoming issue of the MRS BULLETIN.]

The featured speaker at the June meeting was Michael D. Pashley of Philips Laboratories (Briarcliff Manor, NY). Pashley spoke about the strengths and limitations of the scanning tunneling microscope, which has the unique ability of real space imaging of a surface with atomic-scale resolution. He highlighted some of the more promising research areas where STM would have a major impact, emphasizing applications in the electronics industry and the exciting possibilities of using STM for modifying surfaces at the atomic level.

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