

vided by safety bulletin boards on each floor of our building. Also, we maintain a safety equipment display, and signs on the entrance doors to laboratory blocks remind both departmental staff and visitors that eye protection is required. Other safety posters and placards also help to maintain a state of safety awareness in our laboratories. Finally, lists of emergency action personnel (*i.e.*, those trained in CPR and first aid) are posted by emergency telephones on each floor, as well as being distributed to all faculty and staff.

Also of great importance is the fact that all new experimental equipment must undergo a hazard review, which is modeled after industrial hazard evaluation systems. A hazard checksheet, designed to review new equipment plans and procedures as well as providing an itemized list of mechanical, electrical, chemical, compressed gas, and emergency safety factors, is used. Another worksheet, the failure mode effect list, is used to determine how "worst case" component failures effect other components. As a result of this program, safety is built into all new equipment. Also, information on the users, their university and home telephone numbers, and shutdown procedures are posted on each major piece of equipment in our laboratories.

CONCLUSION

From our experience it is clear that the most vital aspect of an ongoing safety program is the commitment and complete support of the faculty. Also, the Safety Committee Chairman and the faculty need to continually push forward in improving laboratory operating procedures, upgrading safety programs, and both inspiring and demanding a serious safety attitude and awareness among all personnel. This is best accomplished by setting an example and by requiring the immediate correction of any and all safety flaws

TABLE 4
Undergraduate Safety Orientation Program

1. Rationale for learning safe work habits in the laboratory.
2. Right-to-Know Law. (Access to hazardous chemical information, work place chemical list, labelling information, right to report Right-to-Know violations without retribution.)
3. Protective equipment.
4. Review of special protection and handling requirements for hazardous materials in each laboratory experiment.
5. Review of non-chemical hazards in each experiment.
6. First Aid and Emergency Procedures. (First aid, fires, spills and broken glass, use of location of first aid kits, emergency showers, eyewashers and emergency exits. Calling for help.)

which are found. All (especially the safety committee) need to become proficient in recognizing potential safety flaws before they become serious problems. Also, departmental safety rules need to be applied realistically and, most importantly, firmly and uniformly.

Laboratory safety is in everyone's best interest. This must be realized by all those who enter laboratories. The rewards of avoiding serious accidents and/or injuries are immeasurable and greatly outweigh the minor inconveniences of a safety program.

(Note: A copy of the Safety Manual of the Department of Chemical Engineering at the University of Delaware and the Hazard Review Checksheet are available on request from the authors.) □

ChE books received

Chemistry and Biochemistry of the Amino Acids, Edited by G. C. Barrett; Chapman & Hall, 29 West 35th St., New York 10001; 684 pages, \$99 (1985)

Recent Advances in the Engineering Analysis of Chemically Reacting Systems, Edited by L. K. Doraiswamy; Halsted Press, John Wiley & Sons, NY 10158; 611 pages, \$49.95 (1984)

Lubricants and Related Products, Dieter Klamann; Verlay Chemie International, Deerfield Beach, FL 33441-1705; 489 pages, \$43.60 (1984)

Enzyme Chemistry, Impact and Applications, Edited by Colin J. Suckling; Chapman & Hall, 29 West 35th St., New York, NY 10001; 255 pages, \$36.00 (1984)

Chemistry of Pyrotechnics: Basic Principles and Theory, John A. Conkling; Marcel Dekker, 270 Madison Ave., New York, NY 10016; 190 pages, \$49.75 (1985)

Organic Reactions, Vol. 34, Edited by A. S. Kende, et al; John Wiley & Sons, Inc., Somerset, NJ 08873; 412 pages, \$49.95 (1985)

Nitric Acid and Fertilizer Nitrates, Edited by Cornelius Keleti; Marcel Dekker, 270 Madison Ave., New York, NY 10016; 378 pages, \$95.00 (1985)

Sixth Symposium on Biotechnology for Fuels and Chemicals, Charles D. Scott, Editor; John Wiley & Sons, Inc., Somerset, NJ 08873; 697 pages, \$74.95 (1985)

The Organic Chem Lab Survival Manual: A Students' Guide to Techniques, James W. Zubrick; John Wiley & Sons, Inc., Somerset, NJ 08873; 244 pages (1985)

Flame and Combustion, Second edition, J. A. Barnard and J. N. Bradley; Chapman & Hall, 29 W. 35th St., New York, NY 10001; 308 pages, \$55 cloth, \$27 paper (1985)

Chemistry of Hydrocarbon Combustion, D. J. Hucknall; Chapman & Hall, 29 West 35th St., New York, NY 10001; 415 pages, \$85.00 (1985)

Surface Coatings, Vol. 2—Paints and Their Applications, Oil and Colour Chemists' Assn. of Australia; Chapman & Hall, 29 W. 35th St., New York, NY 10001; 899 pages, \$65.00 (1985)