Science

Metal chirality transferred via triple bond

Newly-synthesized rhenium acetylide complexes can undergo stereospecific reactions in which—surprisingly—chirality is transferred through a carbon-carbon triple bond that has formal cylindrical symmetry, according to Andrew Wong and John A. Gladysz of the department of chemistry at the University of California, Los Angeles [*J. Am. Chem. Soc.*, **104**, 4948 (1982)]. During reactions that involve the attack of electrophilic reagents on such complexes, chirality about the transition metal is transmitted through the triple bond, thus allowing only one of two possible stereoisomer products to form. "Such stereospecificity is to our knowledge unprecedented," the California chemists note.

Polyamine model for body's control of pH

Macrocyclic polyamines can take up the physiologically important anion, carbonate, and thus may provide a chemical model of how the body regulates its acid-base balance through respiration, according to Eiichi Kimura and his colleagues at Hiroshima University and Hirosaki University in Japan [*J. Am. Chem. Soc.*, **104**, 4984 (1982)]. The researchers note that their "most important discovery" is that a proton is liberated at neutral pH when such polyamines interact with carbonate. This, they say, may help explain how carbonate is taken up and transported in the body and how strong acids (such as hydrochloric acid) can be produced from weak acids in specialized cells lining the stomach.

View of elemental sulfur chemistry changes

Instead of remaining exclusively in an eight-membered ring in solution, elemental sulfur spends about 1% of the time as seven- and six-membered rings, which are far more chemically reactive, according to Fred N. Tebbe, E. Wasserman, and their colleagues at Du Pont's Experimental Station in Wilmington, Del. [*J. Am. Chem. Soc.*, **104**, 4971 (1982)]. The mix of these species is influenced by the solvent they're in and also by exposure to heat and light. "The discovery of this equilibrium and processes that facilitate its attainment are potentially of value in defining and controlling the chemistry of sulfur," the group notes.

Chemistry history newsletter published

The Center for History of Chemistry, sponsored by the American Chemical Society and the University of Pennsylvania, has begun to publish a newsletter, *CHOC News*. Editor of the newsletter, an occasional publication, is Jeffrey L. Sturchio, assistant professor of history at New Jersey Institute of Technology. The Center for History of Chemistry was established in January, but didn't get under way until April with the first meeting of the policy council (C&EN, May 10, page 44). It since has been working on establishing a strong national advisory board. Those interested in receiving future issues of the newsletter can write to Center for History of Chemistry, E. F. Smith Hall/D6, University of Pennsylvania, 215 South 34th St., Philadelphia, Pa. 19104. Telephone is (215) 898-4896.

Westheimer wins Welch Award

Chemistry professor Frank H. Westheimer of Harvard University has been named the recipient of the 1982 Welch Award in Chemistry, presented by Houston's Robert A. Welch Foundation. The award of $150,000 and a gold medal is made to a person deemed to have made significant scientific research advancements that contribute to the betterment of mankind. In addition to his research work in bio-organic chemistry—for example, studies leading to a better understanding of enzyme action—Westheimer has been active in science and public affairs.

Technology

Process removes sulfur dioxide

A new process that could overcome some of the problems of removing sulfur dioxide from flue gas streams has been proposed by NBS chemists Richard I. Martinez and John T. Herron, who are receiving a patent on it this week (U.S. 4,351,810). In the reaction scheme, ozone, a suitable olefin such as propylene, and water vapor would be added to the gas stream. The olefin and ozone react to form the Criegee intermediate, which, in turn, reacts with the sulfur dioxide, nitrogen oxides, and water vapor to produce sulfuric and nitric acid mists. By injecting ammonia, these acids are converted readily to solid ammonium sulfate and nitrate fertilizer components. Also produced is a ketone such as acetone, which can be recovered or destroyed. Since only gases would be used in the scheme, plumbing problems caused by slurries would be avoided.

New thermometer measures up to 2000 °C

A new optical fiber thermometer made from a single crystal sapphire can measure temperatures to 2000 °C—an increase of 500 °C above the maximum operating temperature of the present thermocouple standard. The new device, developed by Ray Dils of the NBS Center for Chemical Engineering, also has the potential to be 10 times more accurate than the existing standard, NBS says. For the thermometer, NBS contracted with Saphikon, a division of Tyco Corp., to adapt its existing single-crystal alumina growth technology to making a long, low-loss, optical-quality fiber. The present NBS thermometer is 1.25 mm in diameter and 30 cm long, although this could vary depending on application. The thermometer is based on fundamental radiation laws, and may be used to measure thermodynamic temperatures directly. NBS says that discussions with the petrochemical industry indicate that the thermometer might lead to more efficient, accurate, and economical operation of chemical processes at high temperatures.