sieve adsorption, cryogenic trapping, high volume polyurethane foam sampling and dinitrophenylhydrazine liquid impinger sampling.

A 1986 Supplement (PB87-168696) to the report adds four new specific methods. These are: liquid impinger with high performance chromatography; thermasorb/N adsorption with gas chromatography/mass spectrometry; sodium hydroxide liquid impinger with high performance liquid chromatography; and high volume polyurethane foam sampling with high resolution gas chromatography/high resolution mass spectrometry.

A further EPA publication is also available which investigates indoor air quality and the presence of radon gas. 'EPA Air Quality Implementation Plan' (PB87-210712), describes the direction of EPA's research over the next two years, including policy on radon and dissemination priorities on research and information.

Five appendices to the plan add almost 600 pages of detailed supportive information. Appendix A (PB87-210738), Appendix B (PB87-210746), Appendix C & D (PB87-210753) and Appendix E (PB87-210761). All EPA titles are published by the US National Technical Information Service (NTIS). (Microinfo Ltd, PO Box 3, Omega Park, Alton, Hampshire GU34 2PG, UK)

Portable 3-in-1 gas measuring instrument

A portable, microprocessor controlled device has been designed to measure simultaneously and continuously H_2S- and O_2-concentration. This instrument, the Multiwarn can also detect and measure combustables in the ambient air.

The air is supplied to the sensor either by diffusion or by an integrated pump over a probe up to 10 m long. The readings determined are displayed via three illuminated LCD displays.

Each measuring channel is equipped with two adjustable alarm units to activate the pre- or main alarm. The pre-alarm can be acknowledged, the main alarm is a latching alarm. The alarm limit can be exceeded for a maximum of 10 min without activating the alarm if the sealing level is not exceeded.

All readings are stored for an operating duration maximum of 12 h. (Dräger, Meislinger Allee 53/55, D-2400 Lübeck 1, FRG)

Aluminium extruder plant uses PSA

Air Products and Chemicals, Inc. has started up a pressure swing adsorption (PSA) nitrogen system at Three Rivers Aluminum Company (TRACO) in Warrendale, Pennsylvania. The PSA system produces approximately 1200 standard cubic feet per hour of 98% pure nitrogen for shrouding extrusion dies on the company's aluminium presses. Air Products worked closely with TRACO to determine which nitrogen supply method best met the aluminium extruder's needs. Following extensive on-site production trials that simulated varying gas supply conditions, TRACO selected the PSA unit for its overall economy and its ability to supply nitrogen that met the production requirements of the extrusion process. Air Products installed, owns, and maintains the PSA system under a sale-of-gas agreement with TRACO.

PSA nitrogen units produce gas by compressing and purifying a stream of air, which is then passed through a molecular sieve. The sieve adsorbs oxygen from the stream, leaving the remaining gas nitrogen-rich. Air Products' PSA nitrogen systems use a proven, highly efficient carbon molecular sieve developed by Bergbau-Forschung, FRG. The systems are highly flexible. Units can be sized to produce from 200-30000 standard cubic feet per hour of nitrogen with purities from 95 to 99.9%, and are engineered for reliability, long adsorption bed life and easy operation.

Air Products and Chemicals, Inc. is among the largest international suppliers of industrial gases. The company offers a range of nitrogen supply options, including large on-site cryogenic plants, liquid supply systems, and PSA systems. Air Products also provides technical assistance to customers to determine the supply option best suited to individual applications based on expected flow patterns, purity specifications and economic factors. (Air Products and Chemicals, Inc., IGD Gas Products/Adsorption Systems, Allentown, PA 18195, USA)

Separation publications

Details of two recent publications of interest from the American Institute of Chemical Engineers are given below (note that the first listed is reviewed in greater detail elsewhere in this issue):

- *Separations: New Directions for an Old Field — George E. Keller*, 1987, 50 pp, ISBN 0 8169 0420 0, US$10 (AIChE members), US$18 (non-members). An overview of separations processes, applications, and innovative directions of separations science and technology.
- *New Membrane Materials and Processes for Separation — Edited by K.K. Sirkar and D.R. Lloyd*, 1987, 177 pp, US$20 (AIChE members), US$40 (non-members). Recent developments in membrane and separation technology are covered in this volume, including: integration of membranes with other air separation technologies, innovations in nitrogen inerting, and novel uses of microporous membranes.

(AIChE Publications Department, 345 East 47 Street, New York, NY 10017, USA)