

Notes

CHROM. 4977

Oxygen-nitrogen separation on Cr₂O₃ gel

During studies on reversible adsorption of oxygen and nitrogen on various materials, we discovered the use of black Cr₂O₃ gel as solid adsorbent in the gas chromatographic separation of oxygen and nitrogen. This adsorbent has no advantages over the normally used molecular sieve, but it may be a less expensive alternative. The separation of a 0.1 ml air sample is shown in Table I.

TABLE I

SEPARATION OF AIR ON A Cr₂O₃ GEL COLUMN

Column dimensions: length, 1.50 m; I.D., 4 mm. Carrier gas: He, 30 ml/min. Detector: katharometer, 100°. Sample: 0.1 ml air.

| Column temperature (°C) | Retention times (min) | |
|-------------------------|-----------------------|----------------|
| | O ₂ | N ₂ |
| 25 | 1.03 | 1.96 |
| 50 | 0.91 | 1.44 |
| 75 | 0.82 | 1.15 |
| 100 | 0.74 | 0.95 |
| 125 | 0.68 | 0.81 |
| 150 ^a | | |

^a No complete separation; oxygen appears as a shoulder.

Experimental

Adsorbent preparation. The Cr₂O₃ gel was prepared by reduction of a solution of CrO₃ in water by ethanol, according to RUTHRUF *et al.*¹, and dried at 150° for 24 h. For column preparation we used the sieved fraction of 420–600 μm. The column was activated by heating at 350° for 4 h in a stream of He.

Instrumentation. A Becker Multigraph, type 409 gas chromatograph, was used with a four-filament katharometer as detector.

State University of Utrecht,
Croesestraat 77A, Utrecht (The Netherlands)

E. VAN DER VLIST
J. M. DE JONG

1 R. F. RUTHRUF, J. KLEINBERG AND J. DEANE SENSENBAUGH, *Inorganic Synthesis*, Vol. II, McGraw-Hill, New York, 1946, p. 190.

Received May 23rd, 1970

J. Chromatog., 52 (1970) 486