

Isotopically characterized gases for environmental applications



Environmental applications

Pioneering innovation

Reliability of Analysis

Air Liquide certifies all its products by issuing COAs. Critical isotope ratios of all raw materials have been tested and certified.

Isotopic Analysis

Research of isotopic signatures is continuing to increase in various areas. These signatures have become useful tools for a more comprehensive understanding of pollution sources. To aid in this essential research, Air Liquide has developed a range of reference gases for isotope ratio measurements. The five most commonly used elements (C, O, H, N, and S) in stable isotope research are currently available with a large range of isotopic ratios.

Standard Products

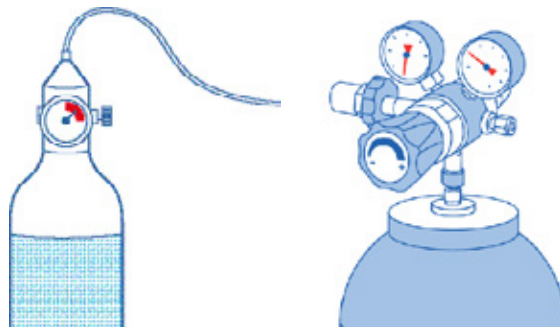
| Selection of Products | Composition | Delta value |
|-------------------------------------|--|--|
| Natural Air | CO ₂ 360 ~ 450 ppm CH ₄ 1700 ~ 2100 ppb CO 30 ~ 300 ppb N ₂ O 320 ~ 335 ppb SF ₆ 6 ~ 10 ppt H ₂ 450 ~ 600 ppb SO ₂ < 60 ppt NO ₂ < 50 ppt NO _x < 50 ppt NO < 50 ppt | CO ₂ , δ ¹³ C= -7.5 ~ -9‰ VPDB CO ₂ , δ ¹⁸ O= -2 ~ +2‰ VPDB |
| CO ₂ in Natural Air | 250 to 520 ppm of CO ₂ | δ ¹³ C= -7.5 ~ -9 ‰ VPDB δ ¹⁸ O= -2 ~ +2‰ VPDB |
| Natural Air without CO ₂ | < 30 ppb of CO ₂ | δ ¹³ C=-7.5 ~ -9 ‰ VPD δ ¹⁸ O=-2 ~ +2‰ VPDB |
| Standard Package | Cylinder: Aluminum 20L, 30L, 40L Valve: Rotarex D200 Connection: DIN14 | |

Custom Products

| Elements | Delta Ratio of | Range | Gas Selections |
|----------|--------------------------|----------------|---|
| C | ¹³ δ ~‰ VPDB | -70 to +20 | Air, CH ₄ and mixtures |
| C | ¹³ δ ~‰ VPDB | Please inquire | C ₂ H ₆ , C ₃ H ₈ , n-C ₄ H ₁₀ , i-C ₄ H ₁₀ , n-C ₅ -H ₁₂ , i-C ₅ H ₁₂ and mixtures |
| O | ¹⁸ δ ~‰ VSMOW | -30 to +10 | CO, CO ₂ , Air and mixtures |
| H | ² δ ~‰ VSMOW | -300 to +100 | CH ₄ and mixtures |
| H | ² δ ~‰ VSMOW | Please inquire | C ₂ H ₆ , C ₃ H ₈ , n-C ₄ H ₁₀ , i-C ₄ H ₁₀ , n-C ₅ -H ₁₂ , i-C ₅ H ₁₂ , and mixtures |
| N | ¹⁵ δ ~‰ AIR | -20 to +20 | N ₂ , N ₂ O, NO _x , Air and mixtures |
| S | ³² δ ~‰ VCDT | -20 to +20 | SO ₂ , H ₂ S and mixtures |
| S | ³² δ ~‰ VCDT | -25 to +25 | SF ₆ and mixtures (under development) |

Packaging

- A wide range of cylinders sizes for global use
- High Pressure (returnable) and disposable cylinders
- Pressure Regulators to match
- Contact Air Liquide - Specialty Gases



- ✓ Strong expertise
- ✓ Easy to reach
- ✓ Reliable service

Air Liquide Expertise Center

High purity gases, mixtures and related equipment for Research & Analysis

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