

## Helium-3, $^3\text{He}$ .



Chemical Purity  $\geq 99.9995\%$   
Isotopic Enrichment  $\geq 99.9$  atom%

$^3\text{He}$  is the very rare stable isotope of ordinary helium. All  $^3\text{He}$  produced today comes from the slow degradation of the radioisotope tritium,  $^3\text{He}$  is principally shipped and used in gaseous form in neutron detectors, spectrometers, medical imaging, ring lasers, dilution refrigerators, and ultra low temperature physics research. Helium-3 is an odorless, colorless, and tasteless high pressure gas.

### Physical and chemical properties

Chemical purity	$\geq 99.9995\%$ Total impurities as specified below $\leq 5\text{ppm}$
Isotopic enrichment $^3\text{He}$ atomic fraction (%)	$\geq 99.9$ Atom%
Molecular weight	3.016g/mol
Gas density @ 21.1°C (70°F) ("NTP"):	0.0078 Lb/ft <sub>3</sub> (0.125 Kg/m <sup>3</sup> ) (0.125 G/ltr)
@ 0°C ("STP"):	0.0084 Lb/ft <sub>3</sub> (0.135 Kg/m <sup>3</sup> ) (0.135 G/ltr)
Boiling point @ 1 atm	-269.96°C
Freezing/Melting point @ 1 atm:	None
Solubility in water vol/vol at 20°C (68°F) and 1 atm:	8.61 M <sub>3</sub> /1 kg water
Gas Density	0.125g/L
Critical pressure:	-2.7 Psia (0.186 Bar)
Coefficient water/Oil distribution:	Not applicable
Odor threshold:	Helium-3 is odorless
Appearance, odor and state:	Colorless, odorless gas

### Chemical Purity

COMPONENT	SPECIFICATIONS (MOLE/MOLE)
Oxygen (ppm)	$\leq 1$
Nitrogen (ppm)	$\leq 1$
Carbon Dioxide (ppm)	$\leq 0.5$
Carbon Monoxide (ppm)	$\leq 1$
Argon (ppm)	$\leq 0.5$
Water (ppm)	$\leq 0.1$
Activity (uCi/cc)	$\leq 1.3 \times 10^{-7}$

**Cylinder Specifications**

Size	Water Volume	Maximum Gas Contained
Lecture Bottle (Linde 2)	0.42L	50L
6 (Linde 6)	1.45L	200L
5 (Linde 10)	3L	400L
4 (Linde 30)	8L	1100L

**U.S. Shipping information**

U.S. Dot proper shipping name	Helium, compressed
Hazard class number and description:	2.2 (Non-flammable gas)
UN identification number:	UN 1046
U.S. DOT shipping label(s) required:	Non-flammable gas
CAS number	7440-59-7

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