

18O

Oxygen-18 (18O) in the form of water for Medical Applications

Description

Oxygen-18 is a natural, stable isotope of oxygen and one of the environmental isotopes. ^{18}O is an important precursor for the production of fluorodeoxyglucose (FDG) used in positron emission tomography (PET). Generally, in the radiopharmaceutical industry, enriched water ($\text{H } ^{218}\text{O}$) is bombarded with hydrogen ions in either a cyclotron or linear accelerator, producing fluorine-18.

Isotopic analysis	Units	Value	Limit
O-18	Atom %	98.2	$\geq 98.0\%$
O-17	Atom %	0.60	2.0%
O-16	Atom %	1.20	2.0%
Chemical Purity	m/m	99.99%+	99.99%+
Electrical Conductivity		1.17	3.0
Pyrogen	EU/ml	0.25	0.25
Sterility Test		Passed	Passed
pH		6.47	6.0~7.0
Total Organic Carbon (TOC)	mg/L	1.0	2.0
Fluoride (F)	mg/L	ND (0.006)	0.1
Chloride (Cl)	mg/L	ND (0.007)	0.1
Bromide (Br)	mg/L	ND (0.016)	0.1
Iodide (I)	mg/L	ND (0.002)	0.1
Calcium (Ca)	mg/L	ND (0.02)	0.1
Magnesium (Mg)	mg/L	ND (0.002)	0.05
Sodium (Na)	mg/L	ND (0.01)	0.5



Isotopic analysis	Units	Value	Limit
Potassium (K)	mg/L	ND (0.05)	0.5
Copper (Cu)	mg/L	0.00495	0.05
Iron (Fe)	mg/L	0.00665	0.05
Zinc (Zn)	mg/L	0.00898	0.05
Phosphate (PO4)	mg/L	0.01	0.05
Nitrate (NO3)	mg/L	ND (0.016)	0.05
Sulfate (SO4)	mg/L	ND (0.018)	0.1
Ammonium (NH4)	mg/L	ND (0.02)	1