

OXYGEN-18 (H_2^{18}O)

Enrichment $\geq 98\%$





OXYGEN-18 (I.E. $\geq 98\%$)

► Product description

Oxygen-18 water form (H_2^{18}O) is the chemical pure water with the high isotope enrichment with oxygen-18. It is used in the particle accelerators to get fluorine-18. High enrichment level of target material with oxygen-18 isotope allows to reduce the yield of undesirable by-product nitrogen-13 during the fluorine-18 production.

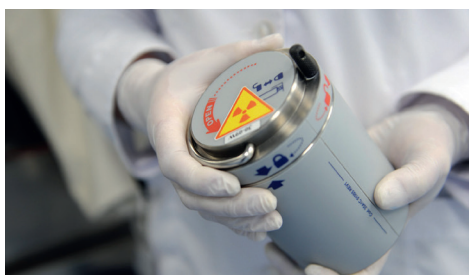
CAS number	^{18}O Isotopic enrichment	Molecular weight
14314-42-2	$\geq 98\%$ at.	20.02 g/mol
H_2^{18}O		

► Product application

Oxygen-18 enriched water is used as a starting material for medical cyclotron production. The bombardment of oxygen-18 with the hydrogen ions (protons) leads to nuclear reaction of $^{18}\text{O}(p,n)^{18}\text{F}$. Produced fluorine-18 is the radionuclide precursor of different diagnostic radiopharmaceuticals used for positron emission tomography (PET):

- ^{18}F -FDG (Fludeoxyglucose)
- ^{18}F -NaF (Sodium fluoride)
- ^{18}F -DOPA (Fluorodopa)
- ^{18}F -Fluorocholine
- ^{18}F -FMISO (Fluoromisonidazole)
- ^{18}F -FET (Fluoroethyl-L-tyrosine)
- ^{18}F -FLT (Fluorothymidine)
- ^{18}F -PSMA-1007

and many others.



Today ^{18}F -FDG is the most widespread PET radiopharmaceutical. ^{18}F -FDG is an analogue of D-glucose, and it is very well adsorbed by cells with increased metabolism. The accumulation of radiotracers in the body's tissues allows to evaluate the intensity of metabolism and reveal the pathological areas, including many types of tumors.



► Description of production process

Oxygen is the most abundant element on Earth. Natural oxygen is a mixture of three stable isotopes: oxygen-16 (99.76 % at.), oxygen-17 (0.04 % at.) and oxygen-18 (0.20 % at.). To enrich water with oxygen-18, the rectification method is used. Separation H_2^{16}O and H_2^{18}O occurs in distillation columns due to a bit difference in the boiling point values.

► Packaging

Oxygen-18 water form (H_2^{18}O) packed in the type I glass vials.
The standard package size is 50 gram per a vial. The smaller package size (e.g. 25 gram) per vial is available under special request.

"Please note that we are also able to purchase the contaminated oxygen-18 water from you."



► QUALITY PARAMETERS OF THE PRODUCT

Test	Method / Reference	Specification
Appearance	Visual inspection	Clear, colorless, free of visible particulate matter
Conductivity	Test of Conductivity	$\leq 1.5 \text{ mS/cm}$
pH	Potentiometric determination of pH	6–8
Oxygen-18 (^{18}O)	Mass spectrometry	$\geq 98.0 \text{ \%at.}$
Deuterium (^2H)	Spectrophotometry	$\approx 0.015 \text{ \%at.}$
Tritium (^3H)	Radiometry	$< 5 \times 10^{-11} \text{ Ci/L}$
Total organic carbon	TOC determination	$\leq 1 \text{ mg/L}$
Bacterial endotoxins	Gel-clot method or Chromogenic method	$< 0.25 \text{ EU/ml}$
Sterility	Direct inoculation method	Sterile (passes test)

- Expiry date of validity period (retest date) is two years from the manufacturing date.
- Product is manufactured in accordance with GMP requirements.
- Total radioactivity of the product is no more than the natural background.
- Store at 2–30 °C.

For more information, please contact us at:

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