

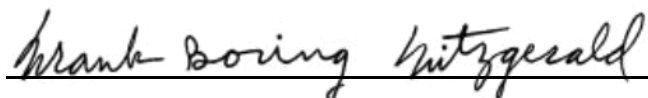
**EXTRACT 100% PURE D₂O FROM COMMON WATER,
AND COMPLEX EXTRACTOR THEREFORE**

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To my dear wife, Velma, with all my love, gratitude, and devotion



ABSTRACT

This paper describes theoretical methodologies and a complex extractor which input is common water and final output is 100% pure D₂O. The extractor contains two principal cascading stages each containing a quartz glass vessel, a Servel type refrigerator, and two precise frequencies of ultra-violet light. In the first stage's vessel, the first pair of UVs separates D₂, H₂, and O₂ from HDO in the common water in that vessel. These gases are then burned into a 50 / 50 mix of H₂O vapor and D₂O vapor in the first Servel refrigerator burner to become the input of the second stage whose output is 100% pure D₂O.

**PRIOR ART AND BACKGROUND SUPPORTING, IN WHOLE OR IN PART,
METHODOLOGIES AND COMPLEX EXTRACTOR HEREIN**

The art of producing and utilizing a precise UV frequency has been known for some time, and used in nuclear countries as one form of Uranium enrichment, which targeted U isotope precipitates from other Uranium isotopes in Uranium Tetrafluoride UF₆ or Uranium Tetrafluoride

UF₄. The U separation art consists of moving one of a selected U's valence electrons to its parking orbit by absorption of a precise UV frequency photon thus making that U unavailable for correct valence bonding in the compound. Each U isotope requires a different precise UV frequency. When one of a U's valence electrons are in parking orbit, it separates from the F and gives off its parking orbit energy via photon emission, precipitates and is collected as 100% pure.

The art of separating most dissolved gases from common water via raising water temperature to near boiling point and holding for a period of time to allow gases to migrate up and out of the liquid has been known for many years.

The art of separating most moisture from gases by refrigeration has been known for many years.

The art of separating residual moisture from gases by drying has been known for many years.

The art of using a combustible gas in heating element of a refrigerator has been known for many years; commercially known as a Servel type refrigerator.

The art of cooling a water vapor into liquid water has been known for centuries.

The art of refrigeration using the Servel system has been known for many years.

The art of drying gases containing water vapor has been known for many years.

The art of burning D₂ in O₂ has been know since discovery of D₂.

The herein described methodologies and complex extractor utilize certain technologies which themselves each separately have been known in the prior art for some time but which when uniquely put together, with some additions and modifications, as in the herein particular overall system, such certain of the prior art technologies may now be utilized in a together manner which overall interactive details were not previously obvious to researchers and inventors versed in the art.

SUMMARY

Described herein are theoretical methodologies and a complex extractor for utilizing precise UV laser frequencies for extracting 100% pure D₂O, out of common water in two similar principal stages series coupled. Common water found everywhere on the planet [rain, river, lake, ocean, well, or tap but no sewer nor extractor drain water] contains an abundance of deu-

terium in the form of HDO, at about one part in 6420 hydrogen according to VSMOW, the world standard. [D₂O is found everywhere in common water at about one part in millions which is much too expensive to extract.]

The process, as described herein, of extracting D₂O from common water begins with production of two very precise UV frequencies, f1 and f2, which are fired up into bottom of the first principal stage's vertical quartz glass vessel containing slowly moving upward, common water, at 95°C, itself obtained via filtration, reverse osmosis, and triple distillation. As the UVs penetrate the vessel's common water, absorption takes place of the first precise frequency UV photon, f1, by only a D atom's valence electron in a HDO molecule raising that electron's energy level to that D's parking orbit thus not available for valence with the O in the HO thereafter. A second precise different UV photon, f2, is needed for absorption by the H of HO. That second precise frequency UV photon causes valence electron of the H in the HO to raise its energy level to a parking orbit of that H atom thus it too is not available for valence with the O thereafter. Two freed D atoms combine into D₂ giving up their parking orbit electron energies in the form of emitted photons. Similarly with two freed H atoms. Freed O atoms join in pairs making O₂. Gases D₂, H₂, and O₂ migrate to the water surface at the top of the vessel. From the common water surface D₂, H₂, O₂ gases plus water vapor all then pass into a first stage Servel type refrigerator which precipitates out most of the common water leaving the other gases, D₂, H₂, and O₂ to pass thru a dryer to that refrigerator's heater there to be burned into D₂O plus H₂O vapors which vapors then pass thru the same refrigerator to become water of 50% D₂O and 50% H₂O. These waters are then processed in a second stage vessel similar to the first using two new UV frequencies, f3 and f4 to produce only D₂ and O₂ without touching the H₂O and on thru the second stage Servel type refrigerator to become 100% pure liquid D₂O as the final output.

BRIEF DESCRIPTION OF D₂O COMPLEX EXTRACTOR AND THEORETICAL DESIGN METHODOLOGIES.

[See Drawing 1 page 9. Drawing 2 page 10. Drawing 3 page 11]

Described herein is a complex extractor and its methodologies designed to extract 100% pure D₂O from a pre-treated common water source such as rain, river, lake, ocean, well, or tap but not sewer nor water from extractor drains. All components of the complex extractor which come in contact with the liquids and gases are constructed of quartz glass to minimize effects of contaminates. While it is true some quartz molecules will appear in the final output, they are of little consequence in any application requiring 100% pure D₂O.

The extractor consists of the following several components organized into two principal cascading stages plus the other ancillary components thereto:

A computer. For controlling a pair of dual frequency ultra-violet lasers.

A pair of dual frequency UV lasers, tunable excimer or equivalent. Each of the two UV lasers has a dual frequency output in the UV which is produced via computer programmed pre-selected very precise frequency control of the UV production. Such UV lasers are needed to produce precise frequency UV photons, f1 and f2, to separate first the D via f1, from HDO, and second, the H via f2, from HO in the pre-treated common water of the first stage quartz glass vessel. D₂, H₂, O₂, plus water vapor rise and leave the surface of the common water at the top of that first stage vessel. They are processed in the first stage Servel type refrigerator to produce 50% D₂O plus 50% H₂O. The other two precise UV frequencies, f3 and f4, are used in the second stage quartz glass vessel to separate first a D via f3, from D₂O, then the second D via f4, from DO. The H₂O is untouched by the UVs in the second vessel.

Two quartz glass vessels are kept at 95° C. Quartz glass allows UV to pass into the water contents of the vessels. The first stage vessel contains common water derived from many sources but treated via filtration to remove most solids, reverse osmosis to remove remaining solids and most impurities, triple distilled to remove gases and any residual minerals and contaminants. This clean water then moves very slowly thru the first glass vessel from near bottom and out near top. The outgoing water is hot fresh water and passes thru the heat exchanger to heat the second vessel contents. From the first vessel, the water goes into the fresh water drain. It is not recycled herein because it is free of HDO water. But can be collected and sold.

Two Servel type refrigerators. They have no moving parts. The first stage refrigerator cools the four output gases from the first quartz glass vessel to precipitate most water vapor out of the mix of gases as liquid water which water passes into the fresh water drain. These three remaining gases pass thru a dryer and on to the burner heating element of that same first refrigerator tower. From there that burner element's vapors are cooled into a 50% D₂O / 50% H₂O liquid-water mix in that same refrigerator. It is then passes thru the heat exchanger into the second stage quartz glass vessel for exposure of a new set of two difference UV frequencies, f3 and f4, to detach both Ds from D₂O in the D₂O / H₂O mix. The H₂O water is unaffected by the UVs and passes into the fresh water drain. The second stage vessel's output of D₂, O₂, plus water vapor are passed thru that second stage refrigerator and dryer similarly to the flow in the first stage refrigerator. The remaining two gases D₂ and O₂ burn in that second refrigerator's heating element. The one vapor left is D₂O. It is cooled in the same refrigerator to become the output of the extractor as liquid 100% pure D₂O.

DETAILED DESCRIPTION OF D₂O COMPLEX EXTRACTOR AND THEORETICAL DESIGN METHODOLOGIES

[See Drawing 1 page 9. Drawing 2 page 10. Drawing 3 page 11]

Drawing 1 of the complex D₂O extractor is an overall block diagram of the described D₂O extractor. Drawing 1 of the D₂O extractor is not to scale overall nor to any component.

The complex D₂O extractor, Drawing 1, consists of a number of parts beginning at the input [1], a source of common water such as tap, sea, river, lake, well, or rain.

The input of common water [1] passes through a filter [2] to remove most solids which solids are washed into the sewer drain [5].

Output of the filter [2] passes thru the reverse osmosis device [3] to remove most residual solids and impurities which are washed into the sewer drain [5].

Output of the reverse osmosis device [3] passes thru a triple distiller [4] to remove residual gases and cleanse the common water of leftovers from the reverse osmosis device [3], and which triple distiller [4] output is maintained at about 95° C. Leftovers are washed into the sewer drain [5]

From the triple distiller [4] the cleansed hot common water passes very slowly into the first stage quartz glass vessel [9] at near its bottom to be maintained in the vessel [9] at 95° C.

The bottom of both vessels [9] [10] are optically flat so as not to distort laser input from lasers [6] [8].

In the common water of the first stage vessel [9] arrives laser frequencies f1 and f2 from the dual frequency UV laser [6] controlled via computer [7].

Laser frequency f1 from laser [6] detaches Ds from HDO molecules in the common water of vessel [9] by raising each D's valence electron to a parking orbit. Single Ds eventually join into D₂s giving up valence electron's parking orbit energy as photons.

Laser frequency f2 from laser [6] detaches Hs from HOs in the common water of vessel [9] to become H₂ in like fashion to that of the D₂s.

Left over Os join in pairs as O₂.

The very slowly moving common water in vessel [9] now mostly free of HDO moves out near

the top of vessel [9] to exit into fresh water drain [11] thru heat exchanger [15]. Heat in the exchanger [15] is transferred to flow of waters from output of first stage Servel refrigerator [12] feeding into input of second stage vessel [10].

At the top of vessel [9] gases H_2 , D_2 , O_2 , plus water vapor pass into first Servel type refrigerator [12] at coil [12C] to be cooled to remove liquid water in the first cooling coil [12C] which liquid at the bottom of coil [12C] drains into fresh water drain [11].

The cooled gases, H_2 , D_2 , O_2 , mostly free of water vapor, exit at the coil [12C] top and enter tower [12A] where they pass thru a dryer and then burn in the tower's [12A] heating element of that same first refrigerator [12].

Coil [12D] is the first stage refrigerator's [12] cooling element which coolant is derived from tower [12A].

The output vapors of the heating element in tower [12A] of first refrigerator [12] are cooled in that same refrigerator [12] at coil [12E] which then become a 50 / 50 mix of liquid H_2O and D_2O .

This 50 / 50 mix of waters pass out of first refrigerator [12] from coil [12E] and thru the heat exchanger [15] into the second stage quartz glass vessel [10] near its bottom to pass up and out of second vessel [10] very slowly into fresh water drain [11].

Into this 50 / 50 mix of waters of second vessel [10] arrives laser [8] UV frequencies f_3 and f_4 from the dual frequency UV laser [8] controlled via computer [7].

Laser frequency f_3 from laser [8] detaches a first D from a D_2O molecule in the 50 / 50 water of vessel [10] by raising that first D's valence electron to that D's parking orbit. Single Ds thus freed eventually join into D_2s giving up their parking orbit energies photonically.

Laser frequency f_4 from laser [8] detaches the second D from DO in the water of vessel [10] in like fashion to the first D. Single Ds thus freed eventually join into D_2s in like fashion to the first. The remaining Os eventually join into O_2s .

These two gases, D_2 and O_2 , migrate upward to the water surface of vessel [10].

From the water surface of vessel [10], these two gases, D_2 and O_2 , plus water vapor, leave the second vessel [10] to pass into the second refrigerator [13] at coil [13C].

Coil [13C] of the second refrigerator [13] condenses the water vapor arriving from vessel [10] which water from coil [13C] then exists refrigerator [13] to enter the fresh water drain [11].

This leaves the two gases, D₂ and O₂, to continue thru the coil [13C] to the input of the dryer in tower [13A]. Water from the dryer exists into fresh water drain [11].

From the tower [13A] dryer's output, the two gases, D₂ and O₂, proceed to be burned in the tower [13A] heating element.

Coil [13D] is the second refrigerator's [13] cooling element which coolant is derived from its tower [13A].

Tower [13A] heating element combustion output product, D₂O vapor, proceeds thru coil [13E] condensing into D₂O water as it goes.

The output of coil [13E] is pure 100% D₂O. It is the valued product of the extractor and is stored in storage container [14] which has a valved outlet at [16].

Fresh water drain [11] can feed a storage tank to hold the fresh water which can be sold.

CLAIMS

1. Methodologies and processes are incorporated into the herein described complex extractor, for producing 100% pure D₂O as its output from an input of common water. For utilizing precise UV laser frequencies controlled by computer for producing that end-result output of 100% pure D₂O, in two similar but cascading principal stages each containing a dual frequency laser, a quartz glass vessel maintained at 95°C, a Servel type refrigerator, and a dryer, for separation of component atoms from their sources for further processing leading to the final result as 100% pure D₂O.
2. A method as generally defined in claim 1 whereby complex extractor's two similar principal stages working in cascade to produce the complex extractor output of 100% pure D₂O.
3. A method as generally defined in claim 1 whereby common water input to the extractor is first pre-treated via being cleansed of contaminants and impurities via cascaded filtration, reverse osmosis, and triple distillation devices, before proceeding further into the extractor's first stage vessel.
4. A method as generally defined in claim 1 whereby to generate and supply four precise preprogrammed and controlled UV frequencies; one pre-defined pair to each of the two quartz

glass vessels of these two similar cascading similar principal stages.

5. A method as generally defined in claim 1 whereby a proper 95°C temperature of the liquid in each of the two quartz glass vessels is maintained; first vessel via the triple distiller's 95°C output and second vessel via the heat exchanger between the output of the first quartz glass vessel and the input of the second quartz glass vessel.

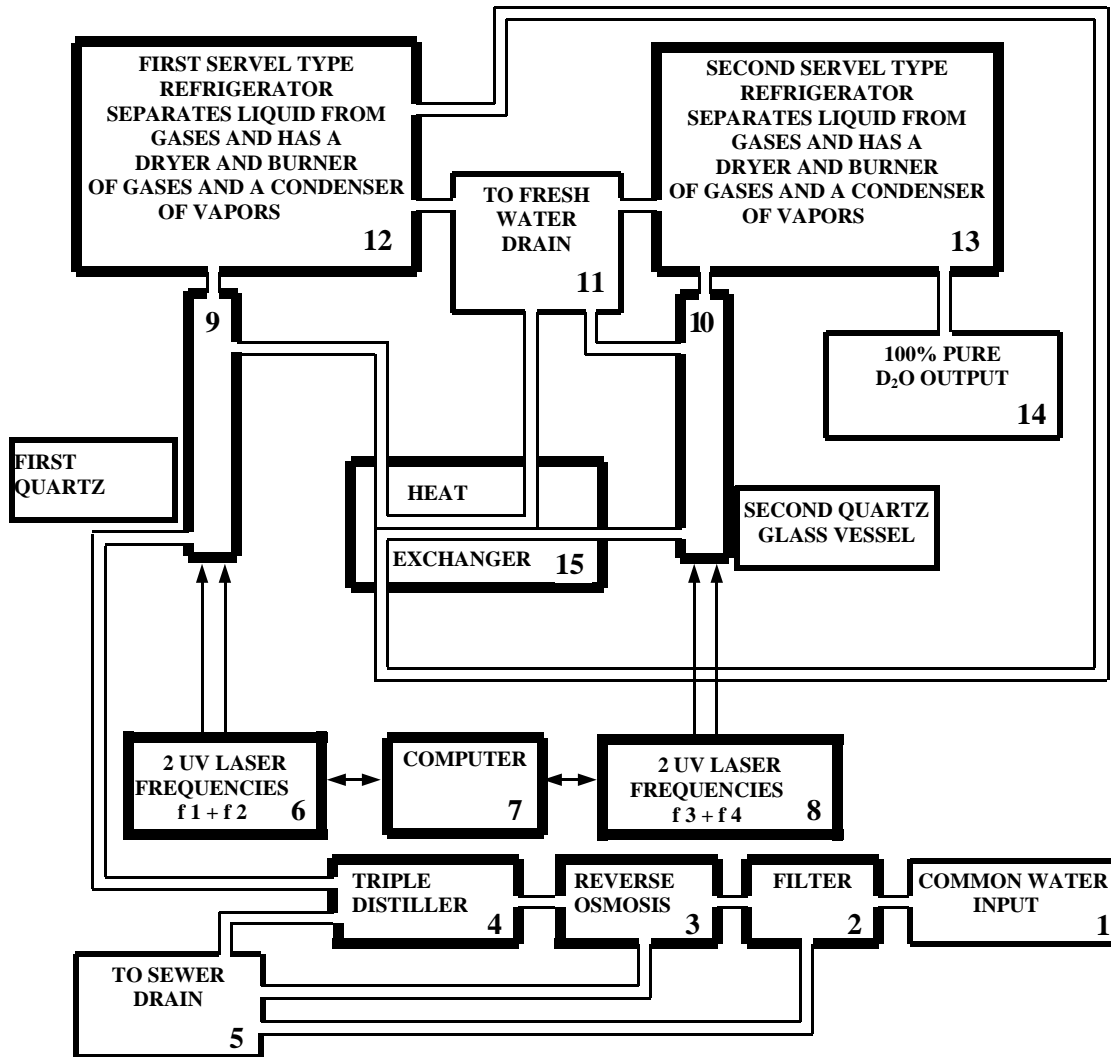
6. A method as generally defined in claim 1 whereby HDO of the common water in the first vessel is turned into three gases, D₂, H₂, and O₂, by means of that first stage's pair of UV frequencies precisely controlled via computer with first UV f1, raising D's valence electron to its parking orbit with second UV f2, raising H's valence electron to its parking orbit. Ds, Hs, and Os find partners to become D₂, H₂, and O₂. some cross joining is bound to happen.

7. A method as generally defined in claim 1 whereby the first Servel type refrigerator of the first principal stage turns the 3 gases of the first quartz glass vessel into a 50% H₂O plus 50% D₂O mixture of liquid waters as its output for inputting into the second stage quartz glass vessel through the heat exchanger.

8. A method as generally defined in claim 1 wherein said 50 / 50 mixture of waters H₂O and D₂O is further processed in the second principal stage in similar fashion to process in first principal stage with a different pair of UV frequencies but output then is 100% pure D₂O.

EXTRACTING PURE D₂O FROM COMMON WATER, AND COMPLEX EXTRACTOR THEREFORE

Drawing 1 of the complex D₂O extractor: Block Diagram

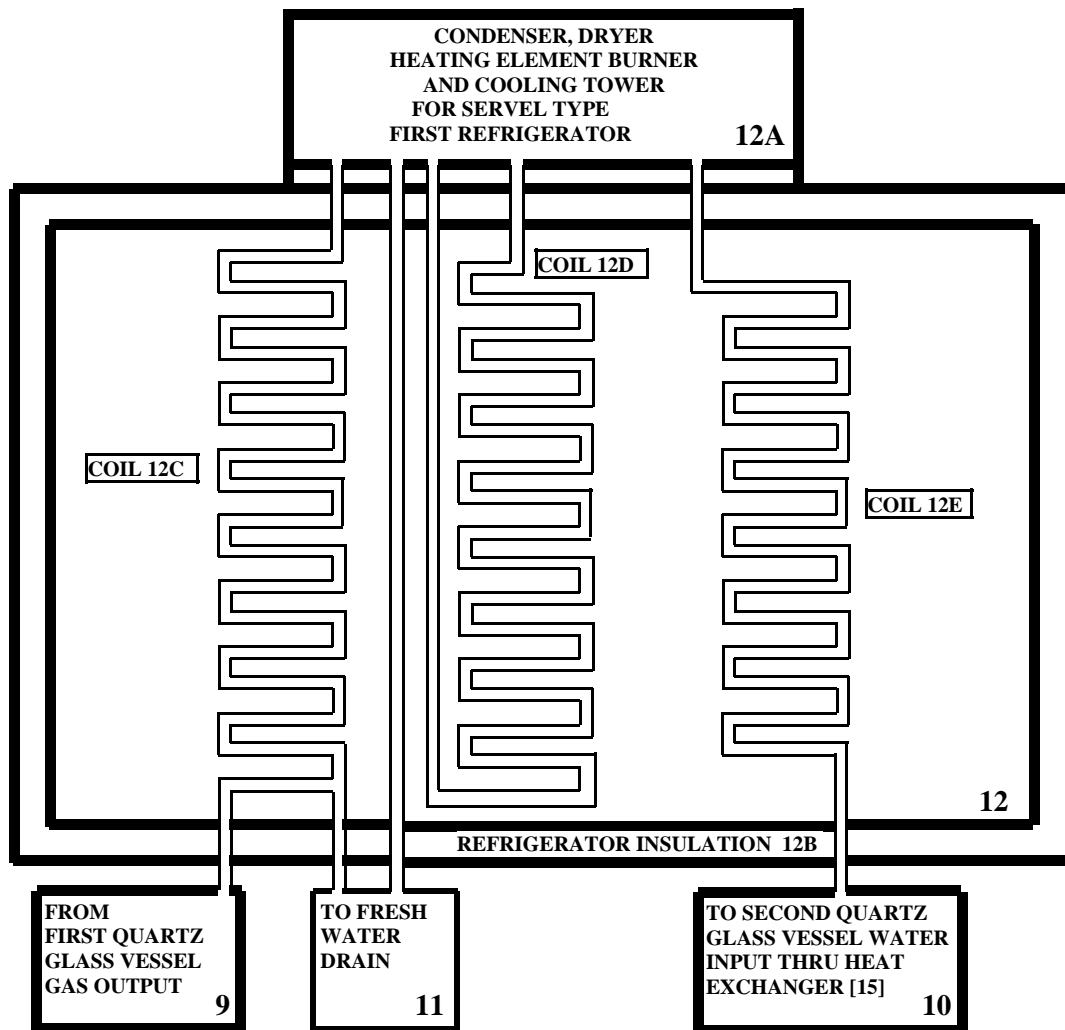


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Drawing 2 of the complex D₂O extractor: First stage Servile type refrigerator and its connections.

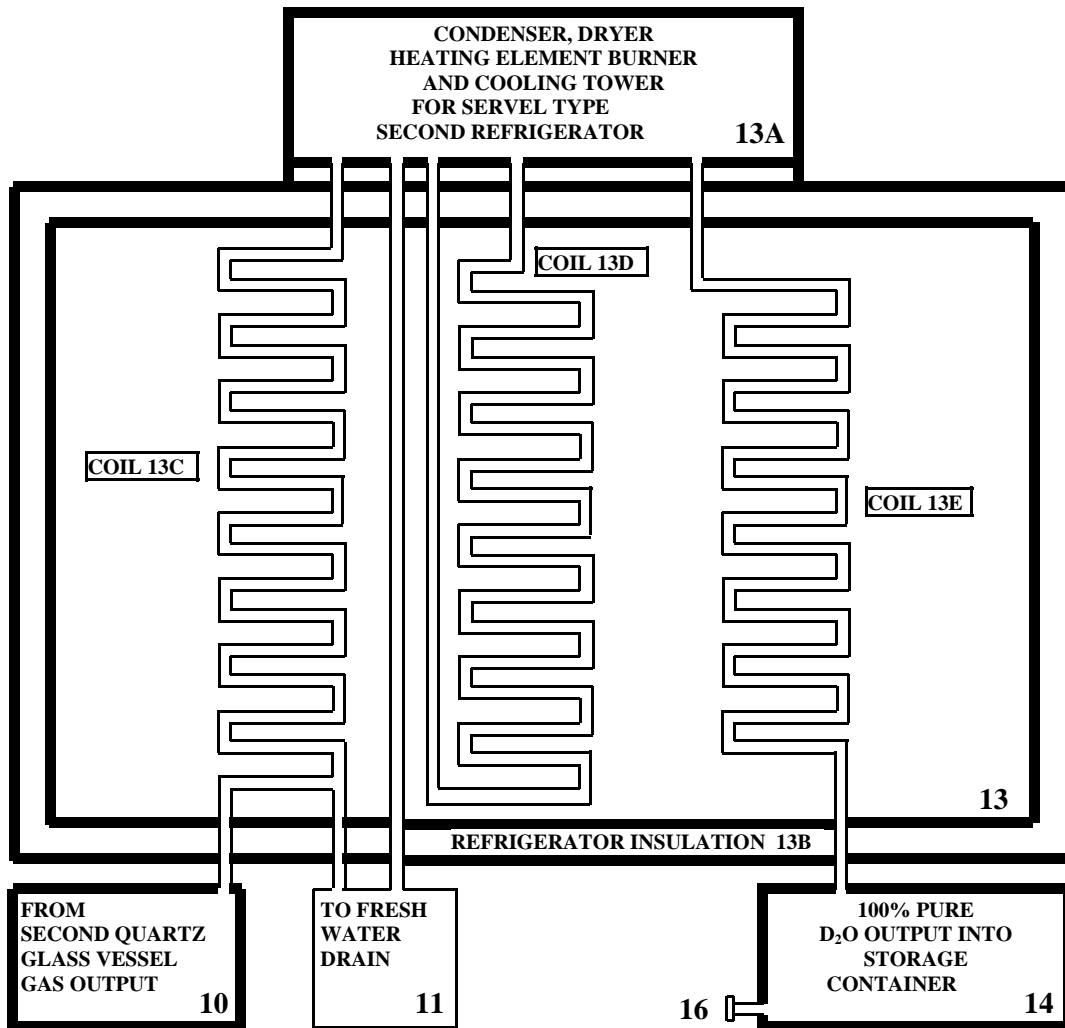


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Drawing 3 of the complex D₂O extractor: Second stage Servile type refrigerator and its connections.



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