THE RARE GAS ISOTOPIC COMPOSITION IN MARTIAN ATMOSPHERE: ADDITIONAL DATA ANALYSIS. L.K.LEVSKY, Institute of Precambrian Geology Academy of Science, Leningrad, USSR.

The data on isotopic composition and concentration of rare gases in the Martian atmosphere (1), can be used for estimation of the planet's degassation and some elements contents in it. The data, obtained in this way, in particular on volatile elements concentration, can be compared with the corresponding values for Earth.

Let us assume that global uranium concentrations for Mars and Earth equal 30 ppb. The acceptance of another value, assume "chondritic" one 10 ppb (that is almost obviously underestimated) will not change the essence of the following estimations. If one accepts the value for $^{244}Pu/^{238}U$ ratio equal to 0.015, that is one assumes that martian formation was synchronized with chondrites accretion, than one can calculate fission xenon contents for the planet as a whole: $^{136}Xe_{fission}{}^{244}Pu = 5.2.10^{-12} sm^3/g$.

At the same time, one can calculate maximum determined $^{136}Xe$ value as equal to $0.8.10^{-13} sm^3/g$, proceeding from $^{132}Xe$ contents in the Martian atmosphere ($3.8.10^{-13} sm^3/g$), estimating the maximum value for $^{136}Xe/^{132}Xe$ as 0.5 according to xenon isotopic composition in the Martian atmosphere (1) and accepting as the primordial $^{136}Xe/^{132}Xe = 0.3$. If one further assumes that the release factors of $^{132}Xe$ and $^{136}Xe$ are approximately equal, then total $^{132}Xe$ contents for the planet as a whole will be: $3.8.10^{-13} sm^3/g. (5.2.10^{-12}/0.8.10^{-13}) = 2.5.10^{-11} sm^3/g$.

Supposition about equal the release factor of $^{132}Xe$ and $^{136}Xe_f$ seems to be quite probable if one takes into account, on the one hand, comparatively short $^{244}Pu$ half-life and, on the other hand, intensive exogenic the Martian rock melting during the first $(100-200).10^6$ years after accretion of Mars.

If on the basis of analogous arguments one assumes equality the release factors of $^{132}Xe$ and $^{129}Xe_{rad}$, that is one accepts that the determined value of $^{129}Xe/^{132}Xe$ ratio is 2.5 in the Martian atmosphere close to the value for the planet as a whole,

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then radiogenic $^{129}Xe$ total contents is $3.8.10^{-11} sm^3/g$. If the initial value of $^{129}I/^{127}I$ ratio for Mars is $1.4.10^{-4}$, then abovementioned radiogenic $^{129}Xe$ concentration corresponds to iodine concentration 15 ppb, it is as much higher as at least three times than the value accepted earlier (2).

Having estimated the value of $^{129}Xe_{rad}/^{136}Xe_{fiss}$ as equal to ~10 in the Martian atmosphere and accepting U/I=60 (3), one can calculate concordant (to $^{129}I$-$^{129}Xe$ and $^{244}Pu$-$^{136}Xe$ (4) formation interval for Mars which in this case is $75.10^6$ years and has the positive value related chondrite Bjurböle. Since earlier Mars formation compared with chondrites is unreal, it is obvious that one of the parameters used for $\delta_{mars}$ calculation is erroneous. It rather concerns iodine concentration, that has to be increased as much as 10 times, that is up to ~5 ppb at $\delta=0$. If one will use more real value $\delta=10^8$y (like one for Earth and achondrites), then iodine concentration ought to be increased as much as ~300 times up to 150ppb, it is as much higher as 10 times than the corresponding value for Earth. It is paradoxal situation. The iodine concentration for Mars can be decreased, if one accepts less duration of the Martian formation interval compared with Earth, however, such choice requires serious grounds.

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