

Technical proposal of F. Lange, V. Maslov, and V. Shpinel "Fission of Uranium Isotopes using the Coriolis Acceleration [\[i\]](#) Method. No later than 1 October [\[ii\]](#) 1940. Secret [\[iii\]](#)

We propose to separate Uranium isotopes by the following way.

It is known that in gas molecules have different speeds. Given that, it is clear that if gas consists of two types of molecules which differ from each other in mass, the proportion of light to heavy molecules will, generally speaking, be different at varying ranges of speed. Namely, in the high speed range, this ratio will be larger than in the low speed range.

Consequently, if we could find an effective method of singling out molecules with speeds lying within a predetermined range from gaseous compounds of uranium, it would be possible to obtain a mixture enriched with a particular isotope.

This is the essence of the proposed method.

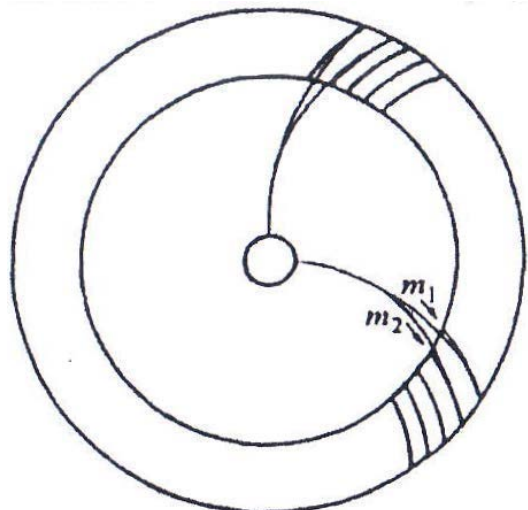
The calculation demonstrates that the ratio of the numbers of the different types of the molecules (before and after selecting particles which have the predetermined speed ranges) is the following:

$$\frac{N_1}{N_2} = \frac{N_1^0}{N_2^0} \left(1 + \frac{m_2 - m_1}{m_2} \cdot 0,59 \right).$$

Here N_1^0 is a number of particles which have mass m_1 , N_2^0 is a number of particles which have mass m_2 before processing of the particles, N_1 and N_2 are the corresponding numbers after processing.

This formula demonstrates that if we use gaseous UF_6 after the first processing, the mixture of the Uranium isotopes will be enriched by 0,5 %. If we repeat this processing multiple times the enrichment could reach the necessary level (according to existing information, this level may be several percent).

We propose to conduct the selection of the predetermined speed ranges using coriolis acceleration. The scheme of this processing is clarified in the attached drawing.



At the center of the revolving cylindrical vessel is vaporized fluid. The molecules fly from here in various directions. But, due to the Coriolis acceleration triggered by the rotation of the vessel, their flight paths will curve on trajectories which are connected with the cylinder.

Thus, the particles will be separated by taking into account their speeds because the size of curvature depends on the speed of the particles. It is necessary to separate the particles with the same continuous curves (this could be done through making corresponding channels in the cylinder which is demonstrated in the drawing).

As a result, the particles which have the same speeds will collect at different places inside of the cylinder.

Lange

[\[i\]](#) The proposal was sent to the Uranium Problem Commission [*note by editors of Atomic Project of USSR*"]

[\[ii\]](#) The date is determined basing on the date of registering the file in which this document was the first [*note by editors of Atomic Project of USSR*"]

[\[iii\]](#) This label was handwritten after printing the document [*note by editors of Atomic Project of USSR*"]