EARTH SCIENCES

'WATER MEMORY' NOT A DELUSION. EVALUATION OF THE STABILITY OF WATER CLUSTERS

Shevchenko I.
PhD, Senior Researcher, M. P. Semenenko Institute of Geochemistry Mineralogy and Ore Formation; Kyiv, 03142 Ukraine
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Abstract
It has recently been discovered that muons produced in the Earth's atmosphere by solar radiation have a strong dynamic influence on hydrolytic processes on Earth. Muons break hydrogen bonds between water molecules, destroy water clusters and increase their hydrolytic activity. Due to constant fluctuations in the intensity of the solar influence and position of the Sun in the sky, the rate of hydrolytic processes is very dynamic and can change over the course of a year within very large limits (up to 200 times). Damage to water clusters by muons changes their properties. This explains well the instability of the mysterious phenomenon widely known as 'Water Memory'.

Keywords: water; clusters; solar influence; muons; hydrolysis

Introduction

We have recently found that muons constantly generated in the upper atmosphere by the solar wind and cosmic rays, perform an important function on the Earth in hydrolytic processes. [1] Muons destroy water clusters braking hydrogen bonds between water molecules and increase their hydrolytic activity, as small clusters contain much more free hydroxyl groups. Due to the high penetrating ability of muons, such their influence is crucial for all biological processes not only on the Earth`s surface, but also underground, since in the absence of muons water clusters become highly structured and hydrolytic reactions are greatly slowed down. This was confirmed experimentally after the discovery of the muon shielding method. [2} This is also confirmed by the fact that at night and during solar eclipses the hydrolysis of triethyl phosphite slows down significantly. [3] Water clusters are destroyed not only by muons, but also by ultraviolet irradiation. Due to constant fluctuations in solar activity and the redistribution of solar energy as the Earth rotates around its axis and around the Sun, the rate of hydrolytic processes constantly changes (up to 200 times) during the 11-year solar cycle, year, day, and can suddenly change even in a few minutes. This was shown by regular measurements of the rate of hydrolysis of triethyl phosphite [$(EtO)_3P$] in acetonitrile for 6 years 2015-2020 which included 5 years of the second half of the 24-th solar cycle 2015-2019 and the first year 2020 of the 25-th cycle. (Fig.1) [1]

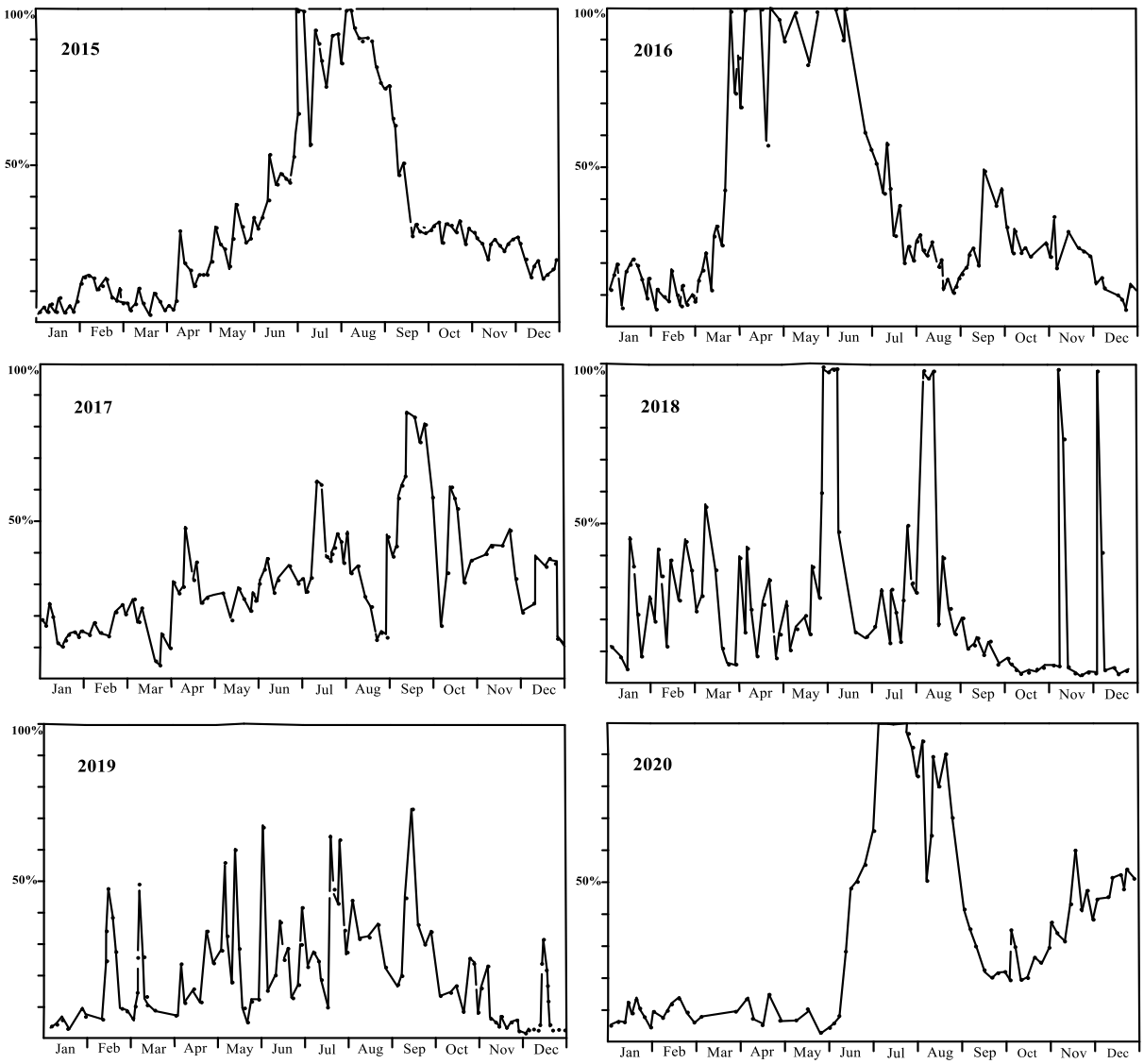

Fig. 1. Variations of the rate of hydrolysis of triethyl phosphite [$(EtO)_3P+H_2O$] in acetonitrile in 2015-2020 (conversion after 25 minutes of heating at 80°C). This period includes the second half of the 24-th solar cycle 2015-2019 and the first year 2020 of the 25-th cycle.

Discussion

The destruction of water clusters by muons under the influence of the Sun explains another mysterious phenomenon, well known as 'water memory'. In 1988 French scientists Jacques Benveniste and his colleagues published the results of their research, which showed that an aqueous solution of anti-IgE antibody retains high biological activity even after very strong dilution (up to 10^{120} times) with bulk water. [5] This can only be explained by the ability of bulk water, added to some aqueous solution, to form clusters that copy the properties of the substances originally dissolved in the copied solution.

This mysterious phenomenon had no scientific explanation and generated great distrust therefore it required experimental confirmation. In July 1988, a special commission arrived at Jacques Benveniste's laboratory in Paris to carry out such an inspection. Seven identical experiments were conducted, four of which confirmed this phenomenon, and the remaining three experiments, for some unknown reason, gave negative result. Similar instability was also noticed by French discoverers. They also found periods of time when the biological activity of the original solution of anti-IgE antibody was not reproduced after its high dilution with water.

Due to contradictory and inconsistent results, the expert committee concluded that the claim that aqueous solutions retain the biological properties of dissolved substances after very strong dilution with pure water is a delusion. [6] However, this conclusion itself was a delusion, since it contradicted the results of the conducted test. Four control experiments confirmed the phenomenon being tested. This would not be possible if the original clusters and their biological activity were not copied and reproduced by the added bulk water.

Grate distrust to this phenomenon and the commission's negative decision are consistent with the existing very low assessment of the stability of water clusters. Today, in mainstream science, the lifetime of water clusters is estimated to be no more than 10 picoseconds. However, this contradicts the experimental results. The phenomenon of 'water memory'

could not have been confirmed in four control experiments in such a short period of time. In our studies, at such instability of water clusters, the hydrolytic activity of the same aqueous solution could not have been different (up to 200 times) in summer and winter (Fig. 1). It also could not have been depended on the geometric shape of the solution and on its position in space. [4]

Interestingly, the discrepancy between the experimental results and the very low estimate of the stability of water clusters is similar to the same paradox with muons, whose lifetime is estimated at 2.2 microseconds. Muons are reliably detected by physical methods even underground. For example, muons were used to study the interior structure of the Egyptian pyramids. [6] To reach the Earth's surface in that time and even penetrate underground, muons, which are 207 times larger than electrons, must travel through the atmosphere at a speed approximately 3 times the speed of light in a vacuum.

The sudden destruction of water clusters by atmospheric muons explains the disappearance of the copying effect in three of the seven control experiments conducted in July 1988. We also consistently recorded very strong and sharp fluctuations in the stability of water clusters during regular measurements of their hydrolytic activity, especially in summer in the middle of the 11-year solar cycle, when the sun's influence is at its maximum. For example, in 2015, a sharp and very strong destruction of clusters began at the end of June and continued until the beginning of September. (Fig. 1) The sharp increase in muon intensity at the end of June is also confirmed by physical methods. [8,9]

The stability of water clusters should also depend on their habitat. The phenomenon of water cluster copying at high dilution was discovered in an aqueous environment in which water clusters are surrounded by unstructured water molecules interacting with other water molecules. Under these conditions, surrounding water molecules can constantly and dynamically form temporary hydrogen bonds with the clusters. This interaction should reduce the clusters' stability.

In an aquatic environment, cluster stability and the phenomenon of their replication can only be assessed by measuring the biological activity of already formed, replicated clusters. The influence of muons on the stability of water clusters and on the replication process itself, when measured in this way, is only evident upon abrupt clusters disruption. To study the stability of water clusters, it is necessary to measure their hydrolytic activity using a chemical method, but this is impossible in an aquatic environment. Therefore, it was important to confirm and investigate the formation and replication of clusters by water in other solvents that do not contain oxygen atoms. For this purpose, for our 6-year study (Fig. 1), the industrial acetonitrile, which initially contains a small amount of water (<0.02%), was chosen.

We have found that even such a small amount of water in acetonitrile does not break down into individual water molecules, but exists in the form of clusters. Their size constantly changes under the influence of muons, depending on fluctuations in the intensity of solar radiation and the position of the Sun in the sky. If bulk water is added to such wet acetonitrile, it will copy these present clusters and reproduce them in large quantities. The resulting water solution acquires very different hydrolytic activities, since it contains either a large number of small active clusters or a small number of large passive clusters. [10] Therefore, under the influence of the Sun, the rate of hydrolysis of triethyl phosphite (Fig. 1) constantly changed dynamically within very large limits, from several minutes at midday in summer to 2 days in winter. [1] This result proves that in acetonitrile, the replicated water clusters are stable at low and unstable at high solar influence.

Daily fluctuations in cluster stability are also significant. At night, muons are not formed, clusters reunite, their size increases significantly, and hydrolytic activity strongly decreases. After sunrise, large clusters immediately begin to disintegrate under the influence of muons. With sharp increases in solar influence, especially in summer, the hydrolytic activity of clusters can strongly increase within minutes. This is confirmed by sharp fluctuations in the rate of triethyl phosphite hydrolysis (Fig. 1). Biological activity should be extremely sensitive to the effects of muons and should disappear immediately and irreversibly even with minor damage to the clusters. Such sudden damage to clusters by muons explains the disappearance of their biological activity.in three of the seven test experiments in July 1988.

The experimental test of the ‘Water Memory’ phenomenon in Paris was conducted in July 1988. This was the maximum solar activity for both the year and the 22nd 11-year solar cycle. At this time, the destruction of water clusters and the increase in their hydrolytic activity can occur very dynamically and abruptly. Therefore, under these conditions, the ‘Water Memory’ effect was confirmed in four of the seven experiments. Under low solar influence, for example in winter, the copying of water clusters with a large excess of bulk water will be much more stable, although sudden destruction of clusters can also occur at this time, as for example in November and December 2018. (Fig. 1)

Conclusion

The assertion that an aqueous solution of anti-IgE antibody cannot retain high biological activity after being highly diluted with bulk water is a delusion. It was based on an incorrect analysis of the experimental verification of this phenomenon in 1988. Four experiments confirmed the phenomenon of "water memory", and the lack of confirmation in three experiments is explained by the sudden collapse of water clusters after a sharp increase in the number of muons in the atmosphere. This newly discovered phenomenon was unknown in 1988, so the experimental test conducted then was misinterpreted. In fact, it confirmed two new phenomena: the copying of the biological activity of other molecules by bulk water at high dilution and the easy disruption of water clusters by muons.

The phenomenon of copying and reproducing water clusters by bulk water was also confirmed in an organic solvent (CH_3CN). This made it possible to study this phenomenon by chemical methods using NMR spectroscopy. It has been established that water clusters are quite stable, but they are easily destroyed by muons, which are constantly formed in the Earth's atmosphere under solar influence. As a result of fluctuations in solar activity and the redistribution of solar influence as the

Earth rotates around the Sun and its axis, the stability of water clusters constantly and dynamically fluctuates over very wide limits. At low solar influence water clusters are stable, and the phenomenon of 'Water Memory' has been reliably confirmed by chemical method. The constant formation of muons in the atmosphere under the solar radiation and the destruction of water clusters under their influence are necessary conditions for the existence of life on Earth. Without muons water clusters would be highly structured and would not have the necessary hydrolytic activity for biological processes, and bulk water would have a 'good memory' and would contribute to the spread of epidemics.

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