EARTH SCIENCES

INFLUENCE OF MUONS ON HYDROLYTIC PROCESSES ON EARTH. EXPLANATION OF THE 'WATER MEMORY' MYSTERY

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Abstract

Muons produced in the atmosphere by the solar wind perform an important function on the Earth in hydrolytic processes. They increase the hydrolytic activity of water clusters, breaking them down to form free hydroxyl groups. In the absence of muons, water clusters are structured to the maximum possible size and lose hydrolytic activity. This was experimentally proven after the absorption of muons by metals was discovered. For example, while in an aluminum screen, large mature water clusters do not react with triethyl phosphite, but after the screen is removed, the muons begin to split water clusters and the reaction begins immediately and accelerates quickly. The discovered rapid splitting of water clusters by muons explains the unstable manifestation of the 'Water Memory' phenomenon. Thus, the self-organization of water molecules, as well as the chemical and biological properties of water clusters, depend on the influence of muons and the intensity of solar radiation.

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

Introduction

We recently discovered that solar radiation breaks the hydrogen bonds between water molecules, which prevents them from self-organizing and destroys water clusters. Small clusters are much more chemically reactive than large ones, since their hydroxyl groups (-OH) are not involved in the network of hydrogen bonds. For this reason, under constantly changing solar activity and distribution of solar energy due to the rotation of the Earth around its axis and around the Sun, clusters decompose and reunite, and the rate of hydrolytic processes with their participation displays diurnal, very large annual variations, and is also modulated by the 11-year cycles of solar activity [1], [2]. This was shown by regular measurements of the rate of hydrolysis of triethyl phosphite 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. The reaction rate difference during this period changed very dynamically and could reach 200 times. (Fig.1)

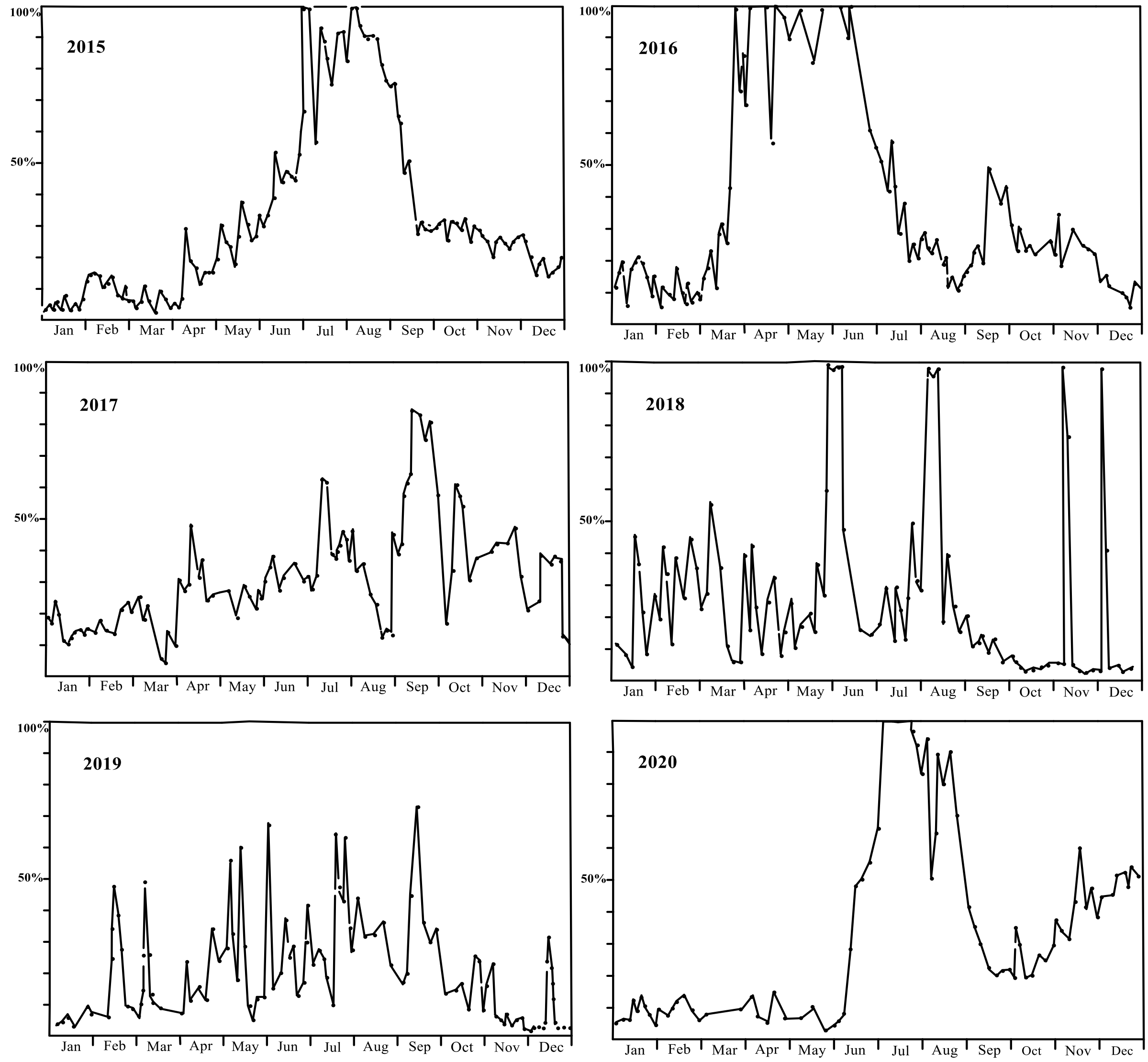

Fig. 1. Variations of the rate of hydrolysis of triethyl phosphite [$(EtO)_3P+H_2O$] in acetonitrile in 2015-2020 (conversion after 25 minutes of heating at 80°C). This period includes the second half of the 24-th solar cycle 2015-2019 and the first year 2020 of the 25-th cycle.

Such significant variations can be accounted for by the decomposition of water clusters under the influence of muons, which are constantly generated in the upper atmosphere by the solar wind. This is confirmed by the following facts. The rate of hydrolysis of triethyl phosphite in acetonitrile significantly increases after sunrise and decreases after sunset. A strong slowdown of the hydrolysis also happens during solar eclipse, when the Moon shields the solar wind, and the formation of muons is greatly weakened. This was observed in August 2017 [1]. The movement of muons in the Earth's atmosphere has also been experimentally proven by studying the structure of the Egyptian pyramids [3].

The destruction of water clusters by muons under the influence of the Sun explains another well-known mysterious phenomenon called 'Water Memory'. French scientists discovered that bulk water, when in contact with organic substances, can copy their biological properties and retain the acquired biological activity even after very strong dilution (up to 10^{120} times) [4]. This unique phenomenon has been tested many times, but is still considered scientifically unproven because it is reproduced very irregularly. For example, in July 1988, a special international commission conducted 7 verification experiments, of which the first 4 confirmed this phenomenon, and the following 3 experiments gave a negative result [5]. The reason for such instability has not yet been explained.

Our studies of water clusters (Fig. 1) showed that their size and hydrolytic activity depend not only on variations in the intensity of solar exposure. It has also been experimentally proven that bulk water, when forming clusters, is capable of copying and reproducing the size of other molecules and its own clusters [6], [7]. If the resulting clusters are also capable of acquiring biological activity, then it should disappear even after minor damage to the clusters. To experimentally study the conditions and rate of destruction of clusters, it was necessary to find a method for their effective shielding from the influence of muons and, under such conditions, to carry out the reaction of triethyl phosphite hydrolysis that we studied.

It is well known that electrons flying in space can be absorbed by metals and form an electric current in them. In radio electronics, the operation of radio tubes is based on this phenomenon. Since muons are comparable to electrons, it was logical to assume that current conductive metals would also be able to absorb muons produced by the solar wind in the Earth's atmosphere. Indeed, such elimination of the influence of muons was easily confirmed experimentally and yielded interesting and important results.

Results and discussion

We have previously found that since the muon flux is anisotropic and depends on the position of the Sun in the sky, the effect of muons on water clusters depends on the geometric shape of the reaction solution and its location in space [8]. Therefore, for the correct comparison of the results of individual experiments, each of them was carried out simultaneously in three differently directed 5-mm NMR-tubes (Vertical, North-South and East-West). After sunset, identical solutions of water in acetonitrile were left to structure overnight in the open air in three differently oriented NMR-tubes wrapped by aluminum foil. The next day after sunrise, triethyl phosphite was added to these solutions, and the tubes continued to be protected with aluminum foil throughout the reaction. At the same time, for comparison, a second similar experiment was carried out in the same place, in which, after overnight structuring of the clusters and the addition of triethyl phosphite to them, the aluminum screen was removed, and hydrolysis in oppositely directed tubes took place under the solar influence.

The results of these experiments in Figure 2 indicate that when the water clusters were shielded by aluminum before and during the reaction, they showed virtually no reaction with triethyl phosphite. After 6 hours, the yield of the hydrolysis product was only 0.5%. This means that after overnight maturation in the aluminum screen, the water clusters were structured to the largest possible size and contained no free hydroxyl groups. And in the second parallel experiment, in which after adding triethyl phosphite, the aluminum shield was removed and the mature large passive clusters were exposed to the destructive action of muons, the reaction started immediately, accelerated very rapidly, and proceeded about 100 times faster. (Fig. 2) On that day, freshly prepared reaction mixtures, without preliminary overnight maturation of water clusters in an aluminum screen, reacted at approximately the same rate.

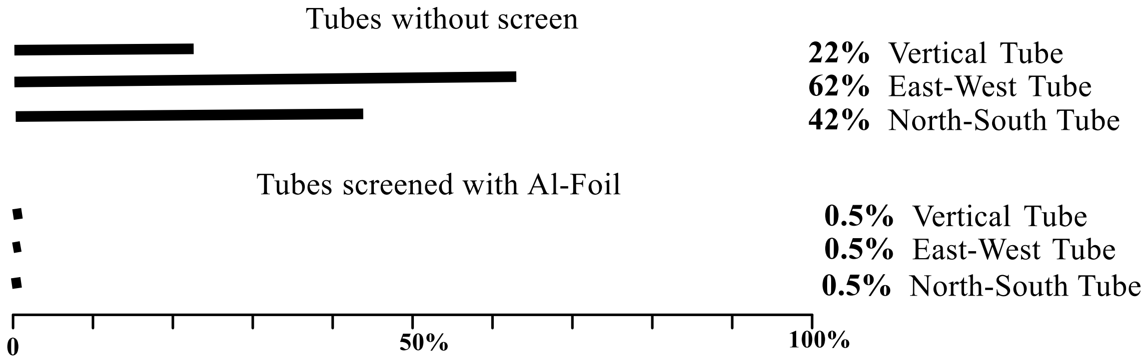

Fig. 2. Hydrolysis rates of $(EtO)_3P$ in December 2024 from 8.00 to 14.00 in multidirectional NMR-tubes unscreened and screened with Al-Foil. Before adding $(EtO)_3P$, water in CH_3CH was allowed to mature in the screened NMR-tubes for 20h overnight.

These results indicate that triethyl phosphite does not react with mature large clusters which do not contain free hydroxyl groups. This reaction begins only after muons break the hydrogen bonds between water molecules in the clusters and form hydroxyl groups, which immediately react with the triethyl phosphite present. Thus, the rate of hydrolysis is determined by the rate of decomposition of water clusters. During the daytime, under the solar influence, the splitting of clusters by muons can occur very quickly and begin suddenly. For example, in November and December 2018, a sharp acceleration of the reaction by 50 times was recorded within a few minutes. (Fig. 1) This also explains why in July 1988, when testing the ‘Water Memory’ phenomenon, the first four experiments confirmed it, and the following three experiments gave a negative result [5].

The unification of clusters, on the contrary, is a slow process that begins to occur after the muons influence ceases. For example, when the reaction that has already begun is shielded with aluminum, it does not stop immediately, but gradually slows down.

Methods

In the evening after sunset water (7mg) was added to acetonitrile (400mg) separately in either of three 5-mm NMR-tubes and the solutions were mixt by shacking. The NMR-tubes were wrapped in several layers of aluminum foil and placed outdoors next to each other in different directions (vertically, east-west and north-south) away from large buildings. After the water clusters had matured overnight, 25 mg of triethyl phosphite was added to each tube in the morning after sunrise (without removing the aluminum foil), and the tubes continued to be shielded throughout the reaction. The reactions were conducted at ambient temperature. At the same time, for comparison, the same experiment was carried out in the same location, but before adding triethyl phosphite, the aluminum screen was replaced with a cardboard one so that the muons could act on the reaction mixture, protected only from light.

The reaction rate was determined by measuring the integral intensities of the signals of triethyl phosphite and diethyl phosphonate in the ^{31}P-NMR spectra. Triethyl phosphite was distilled before use. Acetonitrile was commercial and contained ≤ 0.02% water. Since bulk water can copy and reproduce clusters of different sizes [6], it is important for estimating the rate of cluster destruction by muons that the wet starting acetonitrile initially contains the largest possible clusters. Therefore, the acetonitrile used was stored in an aluminum screen to protect it from muons.

The NMR-tubes used should be from the same manufacturer. They must be checked by this reaction for identity and must not come into contact with other substances.

Conclusions

The conducted experiments and analysis of their results allow us to conclude that the constant formation of muons in the Earth's atmosphere under the influence of the Sun is a necessary condition for many hydrolytic processes involving water clusters. Muons break hydrogen bonds between water molecules, which splits water clusters and increases their hydrolytic activity. Without splitting by muons, water clusters would remain maximally large in size and would not have sufficient reactivity.

The constant destruction of water clusters by muons has another positive quality. It causes an unstable manifestation of the phenomenon called 'Memory of Water'. Bulk water, when forming clusters, is capable of copying the biological activity of other molecules. Without destruction by muons, such biologically active clusters could contribute to the emergence and spread of epidemics and pandemics. The 'Water Memory' phenomenon can only manifest itself more stably at low solar influence, when muons do not quickly destroy water clusters, for example, in winter and after sunset.

The experiments described were conducted in December and in March 2023 at 53°N, and the muon flux was completely shielded by several layers of aluminum foil. Since the muon intensity is constantly changing and can increase sharply and very strongly, more powerful shielding may be required to absorb them, especially in summer. The influence of muons on hydrolytic processes has a direct impact on all forms of life and requires detailed comprehensive study at various points on Earth at different geographic latitudes.

Competing interest

There are no conflicts to declare.

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