

The Dihydrogen Monoxide Hoax

The **dihydrogen monoxide hoax** involves the use of an unfamiliar name for water, then listing some negative effects of water, then asking individuals to help control the seemingly dangerous substance. The [hoax](#) is designed to illustrate how the lack of [scientific](#) knowledge and an exaggerated analysis can lead to misplaced fears. ^[1] "Dihydrogen monoxide", shortened to "DHMO", is a name for [water](#) that is consistent with chemical nomenclature, but that is almost never used.



[Water](#) consists of two [hydrogen](#) atoms and one [oxygen](#) atom.

A popular version of the hoax was created by Eric Lechner, Lars Norpchen and Matthew Kaufman, housemates while attending [UC Santa Cruz](#) in 1990, ^[2] revised by Craig Jackson in 1994, ^[3] and brought to widespread public attention in 1997 when Nathan Zohner, a 14-year-old student, gathered petitions to ban "DHMO" as the basis of his science project, titled "How Gullible Are We?" ^[4]

"Dihydrogen monoxide" may sound dangerous to those with a limited knowledge of chemistry or who hold to an ideal of a "chemical-free" life ([chemophobia](#)). ^[4] The only familiar common usage of the term "monoxide" is in the highly poisonous gas "[carbon monoxide](#)", and the simplified term "[monoxide poisoning](#)" is commonly used to refer to poisoning by this colorless and odorless substance. ^[5] Health officials frequently advise the purchase of [carbon monoxide detectors](#) to protect against this poison, which is sometimes referred to simply as "monoxide".

1. Original web appearance

The first appearance on the web was attributed by the *Pittsburgh Post-Gazette* to the so-called *Coalition to Ban Dihydrogen Monoxide*,^{[6] [3]} a hoax organization started by Craig Jackson following the initial newsgroup discussions. The site included the following warning:^[7]

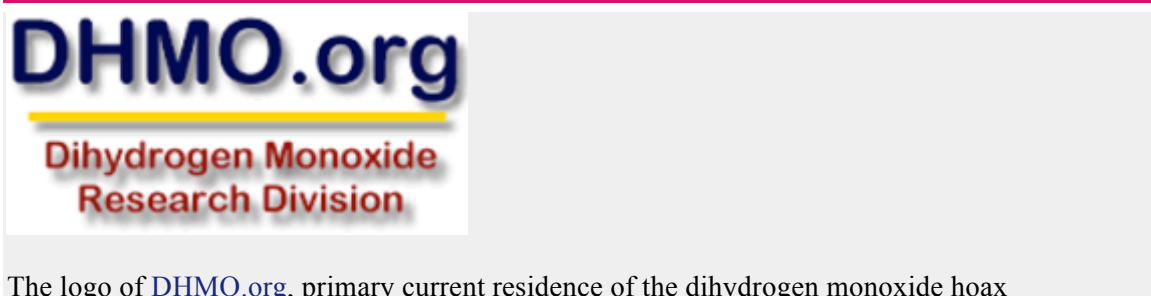
Dihydrogen monoxide:

- is called "[hydroxyl acid](#)", the substance is the major component of [acid rain](#).
- contributes to the "[greenhouse effect](#)".
- may cause severe burns.
- contributes to the [erosion](#) of our natural landscape.
- accelerates [corrosion](#) and rusting of many metals.
- may cause electrical failures and decreased effectiveness of automobile brakes.
- has been found in excised [tumors](#) of terminal [cancer](#) patients.

Despite the danger, dihydrogen monoxide is often used:

- as an industrial solvent and coolant.
- in nuclear power plants.
- in the production of styrofoam.
- as a fire retardant.
- in many forms of cruel animal research.
- in the distribution of pesticides. Even after washing, produce remains contaminated by this chemical.
- as an additive in certain "junk-foods" and other food products.

2. Public efforts involving DHMO



The logo of [DHMO.org](#), primary current residence of the dihydrogen monoxide hoax

- In 1989, Eric Lechner, Lars Norpchen and Matthew Kaufman circulated a Dihydrogen Monoxide contamination warning on the [UC Santa Cruz](#) Campus via photocopied fliers.^[8] The concept originated one afternoon when Kaufman recalled a similar warning about "Hydrogen Hydroxide" that had been published in his mother's hometown paper, the Durand (Michigan) Express, and the three then worked to coin a term that "sounded more dangerous". Lechner typed up the original warning flier on Kaufman's computer, and a trip to the local photocopying center followed that night.

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- In 1994, Craig Jackson created a web page for the Coalition to Ban DHMO. ^[7] The page spread widely on the net and off, including publication as an ad in a 1995 issue of *Analog Magazine*. ^[citation needed]
- The Friends of Hydrogen Hydroxide was created by [Dan Curtis Johnson](#) partly as a foil on the Coalition page, to provide evidence of 'misguided' supporters of dihydrogen monoxide. This form of collaborative connivance is a classic tool of internet spoofers. ^[9]
- In 1997, Nathan Zohner, a 14-year-old junior high student at Eagle Rock Junior High School in [Idaho Falls, Idaho](#), gathered 43 votes to ban the chemical, out of 50 people surveyed among his classmates. Zohner received the first prize at Greater Idaho Falls [Science Fair](#) for analysis of the results of his survey. ^[4] In recognition of his experiment, journalist [James K. Glassman](#) coined the term "Zohnerism" to refer to "the use of a true fact to lead a scientifically and mathematically ignorant public to a false conclusion." ^[10]
- In 1998, drawing inspiration from Jackson's web page and Zohner's research, Tom Way created the website DHMO.org, including links to some legitimate sites such as the [Environmental Protection Agency](#) and [National Institutes of Health](#). Evaluating such sites can be instructive in developing [critical thinking](#) and [information literacy](#) skills. ^[1]
- On [April 1, 1998 \(April Fools' Day\)](#), a member of the [Australian Parliament](#) announced a campaign to ban dihydrogen monoxide internationally. ^[11]
- The idea was used for a segment of an episode of the [Penn & Teller](#) show *[Penn & Teller: Bullshit!](#)*, in which an actor and a camera crew gathered signatures from concerned environmentalists on a petition to ban DHMO. ^[12]
- In March 2004, [Aliso Viejo, California](#) almost considered banning the use of foam containers at city-sponsored events because dihydrogen monoxide is part of their production. A paralegal had asked the [city council](#) to put it on the agenda; he later attributed it to poor research. ^[13] The law was pulled from the agenda before it could come to a vote, but not before the city received a raft of bad publicity. ^[4]
- In 2006, in [Louisville, Kentucky](#), David Karem, executive director of the Waterfront Development Corporation, a public body that operates [Waterfront Park](#), which features a large, accessible public fountain, wished to deter bathers from using the fountain, without mentioning the actual bacterial contamination. "Counting on a lack of understanding about water's chemical makeup," he arranged for signs reading: "DANGER WATER - CONTAINS HIGH LEVELS OF HYDROGEN - KEEP OUT" to be posted on the fountain at public expense. ^{[14] [15]}
- Several online petitions to the British prime minister on this subject have been correctly identified by [the prime minister's office](#) as hoaxes, and rejected.
- In one episode of the children's science show *[How 2](#)*, Fred Dinenage used a glass of water in a [perspex](#) box to carry out the hoax, before drinking the water then explaining the truth.
- In 2007 [Jacqui Dean](#), New Zealand National Party MP, fell for the hoax, writing a letter to Associate Minister of Health [Jim Anderton](#) asking "Does the Expert Advisory Committee on Drugs have a view on the banning of this drug?" ^{[16] [17] [18]}

3. Terminology

The [water molecule](#) has the [chemical formula](#) H_2O , meaning each [molecule](#) of water is composed of two [hydrogen atoms](#) and one [oxygen](#) atom. Literally, the term "dihydrogen monoxide" means "two hydrogen, one oxygen", consistent with its molecular formula: the prefix *di-* in *dihydrogen* means "two", the prefix *mono-* in *monoxide* means "one", and an [oxide](#) is a compound that contains one or more oxygen atoms. ^[19]

The use of numerical prefixes is typical nomenclature for compounds formed by [covalent bonds](#), which are present in water. ^{[20] [21]} The prefix for the first named element is often dropped if the elements involved commonly form only one compound, or even if the number of atoms of the first-named element is the same in all the compounds of the two (or more) elements. ^[19] Thus H_2S is often simply called [hydrogen sulfide](#), and [lithium oxide](#) is a common name for Li_2O . However, the names dihydrogen sulfide, ^[22] dilithium oxide, ^[23] and dilithium monoxide ^[24] are also commonly used both in industry and in universities.

The mono- prefix is often dropped for the second-named element if it is the only common compound the elements form. ^[25] Thus for instance the [IUPAC](#) name of H_2S is hydrogen sulfide rather than hydrogen monosulfide. ^[26] However, since carbon and oxygen can form several compounds (carbon monoxide, carbon dioxide, [tricarbon dioxide](#), and [dicarbon monoxide](#)), the mono- prefix is kept, as it is with silicon monoxide and silicon dioxide. Indeed, hydrogen and oxygen do form another common compound, H_2O_2 . (Using prefix nomenclature, H_2O_2 would be called dihydrogen dioxide—also known as [hydrogen peroxide](#).) Thus, keeping the mono- in dihydrogen monoxide does serve to distinguish it from another compound.

Various names for water are commonly used within the scientific community. Some such names include *hydrogen oxide*, as well as an [alkali](#) name of *hydrogen hydroxide*, and several acid names such as *hydroxic acid*, *hydroxylic acid*, and *hydroxilic acid*. Incidentally, the term "hydroxyl acid" used in the original hoax is slightly incorrect, as it does not follow [convention](#). Additional names of *μ -oxido dihydrogen* and *oxidane* have been developed for this compound.

Under the 2005 revisions of [IUPAC nomenclature of inorganic chemistry](#), there is no single correct name for every compound. ^[27] The primary function of chemical nomenclature is to ensure that the person who hears or reads a chemical name is under no ambiguity as to which chemical compound it refers: each name should refer to a single substance. It is considered less important to ensure that each substance should have a single name, although the number of acceptable names is limited. ^[27] Water is one acceptable name for this compound, even though it is neither a systematic nor international name, and is specific to one phase of the compound. The other IUPAC recommendation is *oxidane*. ^[28]

4. See also

- [Chemical nomenclature](#)
- [Parody science](#)
- [Sense and reference](#)
- [Water intoxication](#)

5. References

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