Variants of pH in Icelandic Precipitation

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Arctic Haze and the Effects of Anthropogenic Factor in the North Atlantic Atmosphere

Abstract/Introduction

Arctic haze is a anthropogenic effect in which particles from industry, commonly SO_4, is trapped in the atmosphere and has the tendency to gather at the poles. During this experiment five samples of precipitation were taken from various locations all in the North of Iceland. Samples were take at different longitudes to account for wind patterns and natural obstacles as well as to test the effects of atmospheric pollutants across the country East to West. To test if pollutants were present, the pH of all the samples was measured and compared to both distilled water with a pH of 7, and glacier ice samples. The purpose of testing pH is to try to detect compounds that have the tendency to be acidic. The samples were gathered in mid-March, during the typical peak season for arctic haze (Shen). The purpose for measuring the effects of arctic haze is that it can give us an idea on the status of the health of our atmosphere, and the effects that industry is having on climate change as well as the effect of industry on environments thousands of miles away from factories.

Methodology

Weather Conditions

-Recent Snowfall

-Light flurries, daily temp= 0 degrees C

Gathering Samples

-Gathered with care not to contaminate.

-Sterile containers

-Stored between 0-25 degrees C

Testing Areas

-Collected in the latitude range of 65-66 North with exception of glacier samples.

-Far from human interaction or industry

-Recent Snowfall

Testing Procedures

When testing the pH of the samples, first the pH meter was calibrated with distilled water. After taking three measurements with distilled water, the pH meter was calibrated, and the other samples were measured. All measurements were taken at 23.33 degrees Celsius. All samples were measured three times and the data was recorded.

Sample Data

Description of Location	Latitude	Longitude	pH Test 1	pH Test 2	pH Test 3	Date collected
Distilled Water Calibration	N/A	N/A	7.00	6.98	6.92	N/A
Lake Myvatn	65.6038	-16.9961	7.87	7.85	7.88	20180311
Godafoss	65.6828	-17.5502	8.42	8.40	8.42	20180311
Kolugljufur C.	65.3324	-20.5698	7.60	7.65	7.62	20180310
Blonduos	65.6594	-20.2816	7.76	7.8	7.81	20180312
Hverir	65.6409	-16.8093	8.00	7.97	7.93	20180311

Average pH

All average results have an instrument error of ±.08 pH

Location (Refer to Lat and Long on T-1.)	pH Average
Lake Myvatn	7.86
Godafoss	8.41
Kolugljufur Canyon	7.62
Blonduos	7.79
Hverir (Hverarond)	7.96

Reference Glacier pH

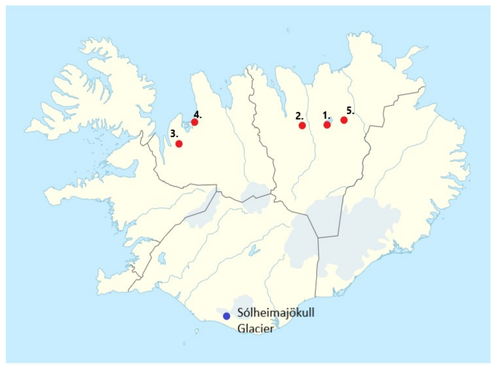
Description of Location	Latitude	Longitude	Average pH
60 meters from base of glacier	63.5569	-19.3028	7.91
100 meters from base of glacier	63.5569	-19.3028	8.01

Sample locations

-Remote Areas, minimal human interaction

-Areas with recent snowfall preferable

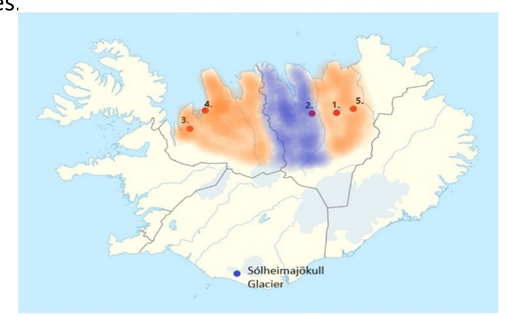
-Collect samples that appear to be undisturbed by outside factors such as wildlife or automotive traffic



Location	Number on Map
Lake Myvatn	1.
Godafoss	2.
Kolugljufur Canyon	3.
Blonduos	4.
Hverir (Hverarond)	5.

Conclusion

The pH levels across Iceland, while do not conclusively prove, suggest that the atmosphere and the precipitation in the atmosphere is being affected by anthropogenic factors. These may include factors like industry with have been know to product biproducts that affect the atmosphere. The result show that samples taken closer to the center of Iceland were more basic, and as samples were taken further east and west of central Iceland, they became more acidic. It is important to note however that none of the samples were rated at below a pH of 7. The data trends simply relieve that while they are not acidic, the samples are becoming more acidic as they move more toward the East and West of Iceland. The effects of this are slightly more prevalent in the East for a number of possible reasons. While there is not data to confirm these hypothesis', the increased acidity could be a result of the city of Reykjavik being in closer proximity. Another hypothesis for the change in pH across longitude could be the effects of arctic haze with the North America effect the pH on the West and Europe effecting the pH on the East. While this is possible, it would require more testing and a more comprehensive analysis of many more samples.



Orange symbolizes lower pH, Blue, higher pH.

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