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Effect of Increasing Mint and Ginger Concentrations on Water Ionization and Conductivity

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Abstract

The aim of this study is to see how the addition of mint and ginger to water with different concentration affect water ionization and conductivity using different containers like glass, steel, plastic and pride. The conductivity results show no considerable changes upon increasing concentrations or changing the container. This may be attributed to the very low sensitivity of the conductivity device. Fortunately, the ionization degree increases with concentration linearly. This may be related to the use of very sensitive ammeter on the scale of µA.

***Key words*:** mint, ginger, concentration, ionization

1.Introduction

Water is very important in most religions. A ritual bath in pure water is performed for the dead in many religions including Islam and Judaism. In Islam, the five daily prayers can be done in most cases after completing washing certain parts of the body using clean water. In Shinto, water is used in almost all rituals to cleanse a person or an area. In Christianity, holy water is water that has been sanctified by a priest for the purpose of baptism, the blessing of persons, places, and objects, or as a means of repelling evil. In Zoroastrianism, water is respected as the source of life. Philosophy The philosopher Empedocles propose that water is one of the four classical basic universe elements along with fire, earth and air. Thales, who was portrayed by Aristotle as an astronomer and an engineer, theorized that the earth, which is denser than water, emerged from the water. Thales, a monist, believed further that all things are made from water. Plato believed the shape of water is an icosahedron which accounts for why it is able to flow easily compared to the cube-shaped earth. In the theory of the four bodily humors, water was associated with phlegm, as being cold and moist. The classical element of water was also one of the five elements in traditional Chinese philosophy, along with earth, fire, wood, and metal. The physical properties of water are very important for our life. The physical properties of water are thus very important to human health**.** Water is used for drinking, since most of human cells contains water [1]. The conductivity and ionization play an important role in the cells activities, where it gives them the important and compounds that activate them. [2, 3]. This motives many researchers to try to improve the quality of water. Some of them design magnetic devices that can improve these properties that activate cells [4, 5]. These equipments provide cells with enough energy, beside increasing their electromagnetic activity [6, 7, 8]. The research made by MasaroImoto shows the effect of container material type on the crystal structure and type of water [9, 10]. Some researchers also show that the addition of silver or titanium to water change some of their physical properties [11, 12]. Due to the important role played by water in our life, this

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work is devoted for studying how increasing concentrations of mint and ginger in water improve its ionization and conductivity.

2. Materials and method

2.1 Material

Four different types of water containers were used. These containers are pride made of clay, container made of steel, container made of plastic and container made of glass. Mint and ginger were added to water with different concentrations.

2.2 Apparatus

The equipments used in this work are conductivity meter, and an electrical circuit consisting of voltmeter, ammeter and two electrodes immersed in water to measure ionization degree.

2.3 Method

1.Water from water pipes are directly added inside the pride clay, glass, steel, and plastic containers

2.The mint and ginger were added to water for about 10 hours with different concentrations (1cc,2cc,3cc up to 10cc) to equal amounts of water

3. Their conductivity, and ionization were measured and recorded in tables and displayed graphically.

3. Results

The following tables and figures exhibited the results of ionization degree and conductivity meter.

Table (1): Relation between concentration and conductivity and volt current (ionization) for Mint in glass after 15min

Concentration(cc)	I(μ A)	Conductivity(μS)	V(volt)
1	5	2	2.5
2	10	2	5
3	15	1.875	8
4	20	1.818	11
5	25	1.786	14
6	30	1.875	16
7	35	1.842	19
8	40	1.818	22

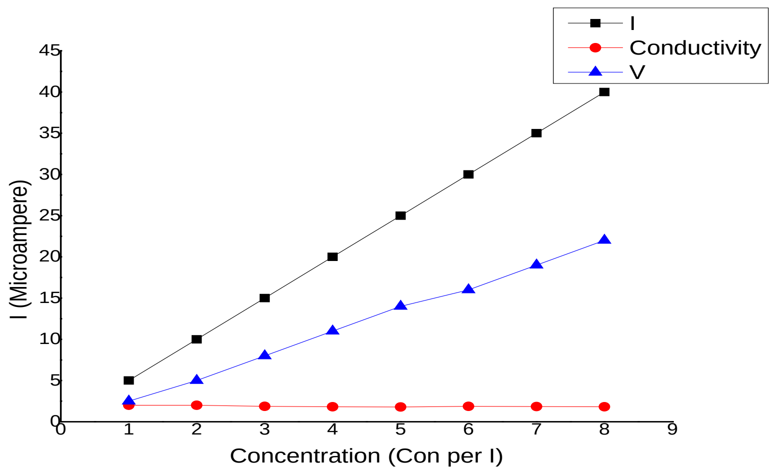

Figure (1): Relation between concentration and conductivity and volt current (ionization) for Mint in glass after 15min

Table (2): Relation between conductivity and volt current (ionization) for Mint in glass after 30min

Concentration(cc)	I(μ A)	Conductivity(μS)	V(volt)
1	5	1.67	3
2	10	1.818	5.5
3	15	1.818	8.25
4	20	1.818	11
5	25	1.786	14
6	30	1.818	16.5
7	35	1.842	19
8	40	1.839	21.75

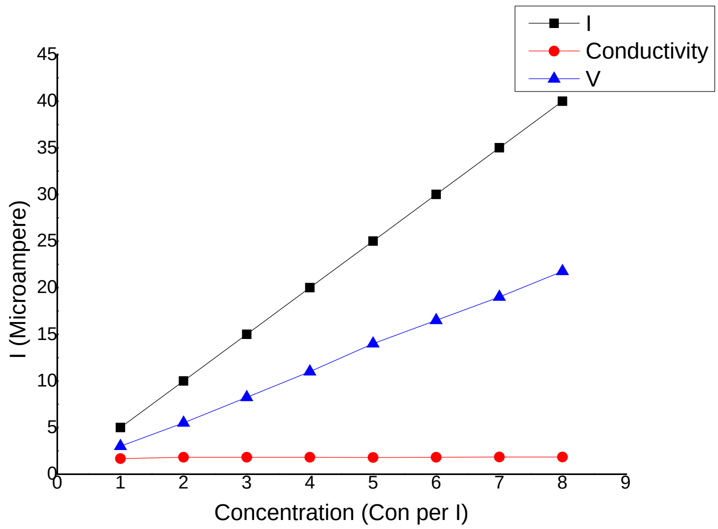

Figure (2): Relation between conductivity and volt current (ionization) for Mint in glass after 30min

Table (3): Relation between conductivity and volt current (ionization) for Mint in glass after 45min

Concentration(cc)	I(μ A)	Conductivity(μS)	V(volt)
1	5	1.818	2.75
2	10	1.818	5.5
3	15	1.765	8.5
4	20	1.861	10.75
5	25	1.852	13.5
6	30	1.875	16
7	35	1.867	18.75
8	40	1.861	21.5

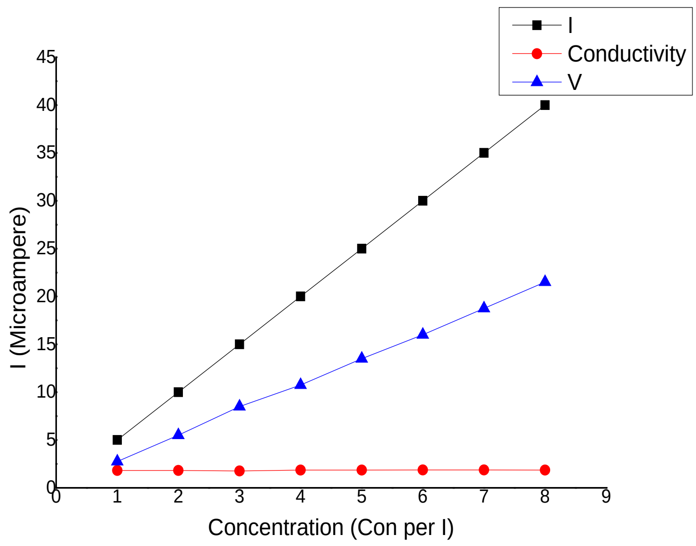

Figure (3): Relation between conductivity and volt current (ionization) for Mint in glass after 45min

Table (4): Relation between conductivity and volt current (ionization) for Mint in steel after 15min

Concentration(cc)	I(μ A)	Conductivity(μS)	V(volt)
1	5	5	.1
2	10	6.25	.16
3	15	7.5	.20
4	20	8.333	.24
5	25	8.333	.30
6	30	7.895	.38
7	35	8.333	.42
8	40	8.696	.46

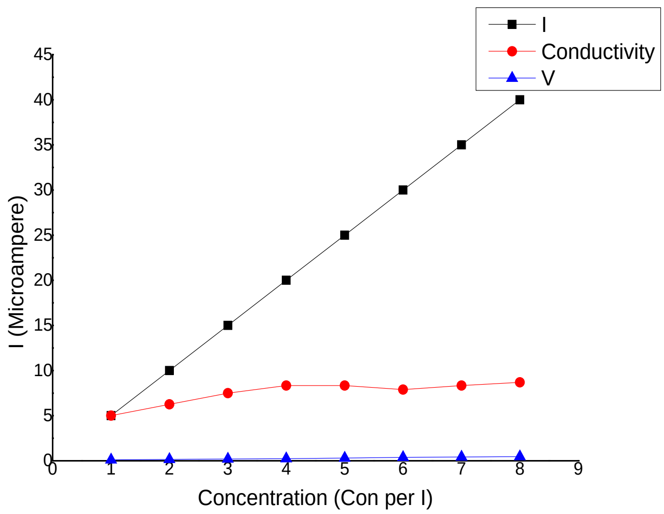

Figure (4): Relation between conductivity and volt current (ionization) for Mint in steel after 15min

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Table (5): Relation between conductivity and volt current (ionization) for Mint in steel after 30min

Concentration(cc)	I(μ A)	Conductivity(μS)	V(volt)
1	5	1.786	.28
2	10	3.125	.32
3	15	4.167	.36
4	20	5.128	.39
5	25	5.814	.43
6	30	6.522	.46
7	35	6.731	.52
8	40	7.407	.54

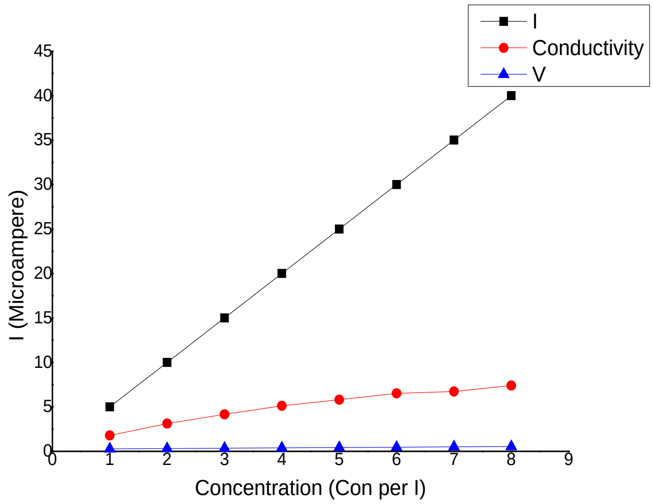

Figure (5): Relation between conductivity and volt current (ionization) for Mint in steel after 30min

Table (6): Relation between conductivity and volt current (ionization) for Mint in glass after 24hour

Concentration(cc)	I(μ A)	Conductivity(μS)	V(volt)
1	5	2.778	.18
2	10	3.571	.28
3	15	4.412	.34
4	20	5.263	.38
5	25	5.952	.42
6	30	6.522	.46
7	35	7	.50
8	40	7.273	.55

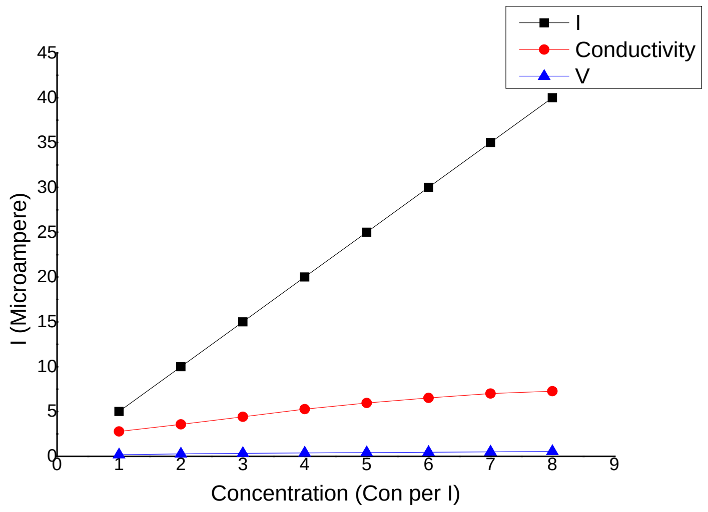

Figure (6): Relation between conductivity and volt current (ionization) for Mint in glass after 24hour

Table (7): Relation between conductivity and volt current (ionization) for Mint in plastic after 15min

Concentration(cc)	I(μ A)	Conductivity(μS)	V(volt)
1	5	6.25	.08
2	10	7.143	.14
3	15	6.818	.22
4	20	7.143	.28
5	25	7.353	.34
6	30	6.818	.44
7	35	7	.50
8	40	6.897	.58

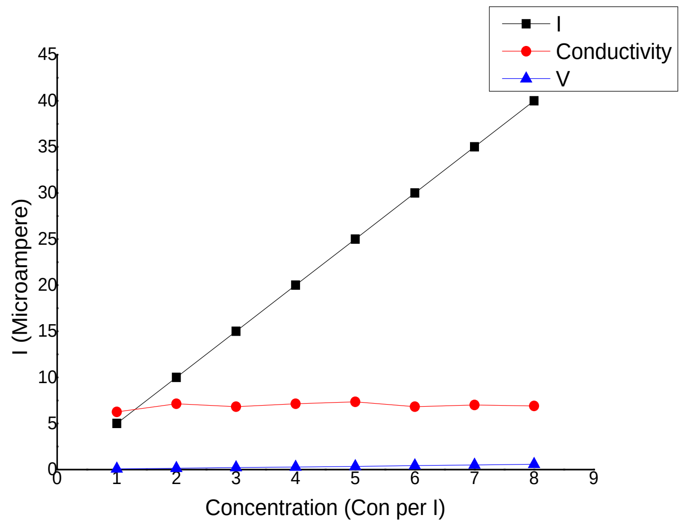

Figure (7): Relation between conductivity and volt current (ionization) for Mint in plastic after 15min

Table (8): Relation between conductivity and volt current (ionization) for Mint in pride after 15min

Concentration(cc)	I (μ A)	Conductivity(μS)	V(volt)
1	5	6.25	.08
2	10	6.25	.16
3	15	6.25	.24
4	20	6.452	.31
5	25	6.25	.40
6	30	6.522	.46
7	35	6.731	.52
8	40	6.897	.58

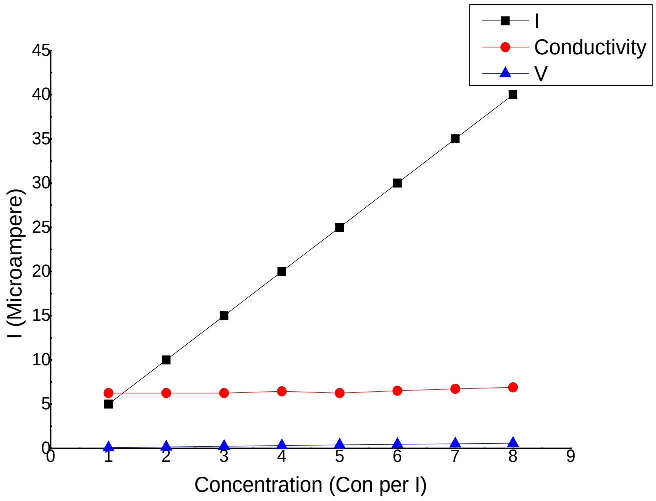

Figure (8): Relation between conductivity and volt current (ionization) for Mint in pride after 15min

Table (9): Relation between conductivity and volt current (ionization) for ginger glass after 0min

Concentration(cc)	I (μ A)	Conductivity(μS)	V(volt)
1	5	3.333	.015
2	10	2.5	.04
3	15	2.727	.055
4	20	2.667	.075
5	25	2.632	.095
6	30	2.727	.11
7	35	2.692	.13
8	40	2.667	.15

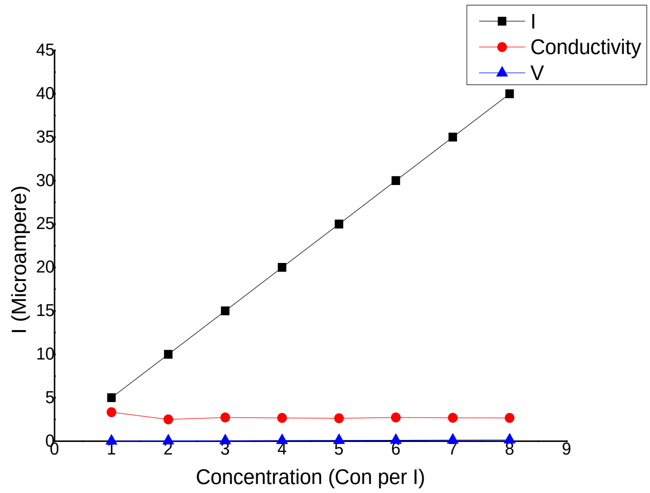

Figure (9): Relation between conductivity and volt current (ionization) for ginger glass after 0min

Table (10): Relation between conductivity and volt current (ionization) for ginger glass after 15min

Concentration(cc)	I(μ A)	Conductivity(μS)	V(volt)
1	5	2	.02
2	10	2.222	.045
3	15	2	.075
4	20	2	.1
5	25	1.852	.135
6	30	1.714	.175
7	35	1.667	.21
8	40	1.633	.245

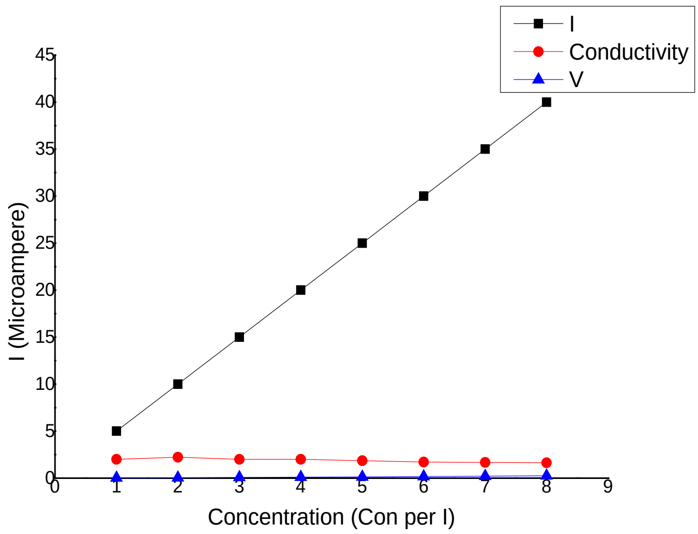

Figure (10): Relation between conductivity and volt current (ionization) for ginger glass after 15min

Table (11): Relation between conductivity and volt current (ionization) for ginger in glass after 30min

Concentration(cc)	I(μ A)	Conductivity(μS)	V(volt)
1	5	5.882	.085
2	10	7.692	.13
3	15	8.824	.17
4	20	9.524	.21
5	25	1.020	.245
6	30	1.091	.275
7	35	1.029	.34
8	40	1.111	.36

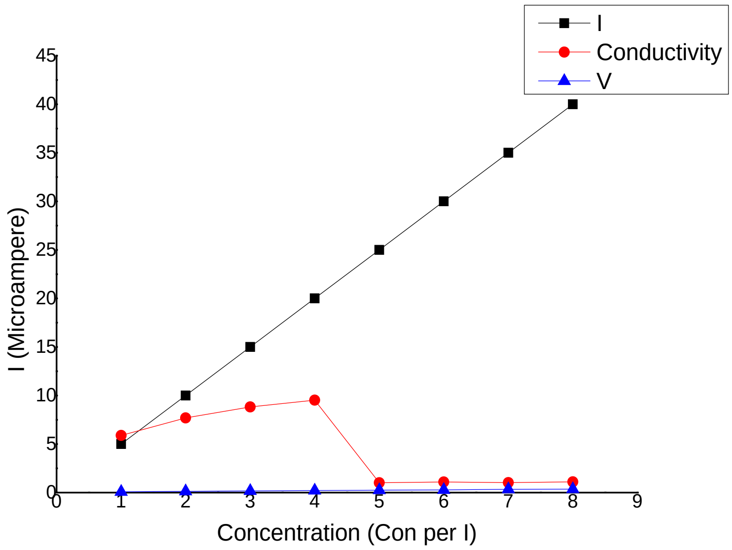

Figure (11): Relation between conductivity and volt current (ionization) for ginger in glass after 30min

Table (12): Relation between conductivity and volt current (ionization) for ginger in glass after 45min

Concentration(cc)	I(μ A)	Conductivity(μS)	V(volt)
1	5	5	.1
2	10	7.143	.14
3	15	8.333	.18
4	20	9.091	.22
5	25	9.615	.26
6	30	1	.30
7	35	1.029	.34
8	40	1.053	.38

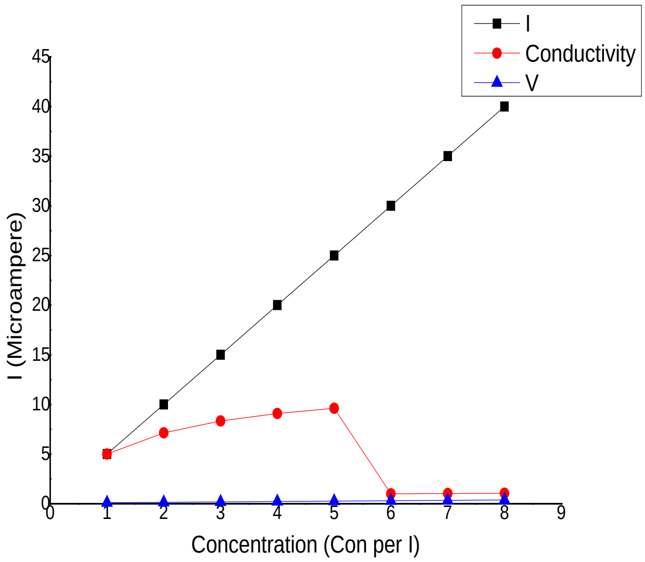

Figure (12): Relation between conductivity and volt current (ionization) for ginger in glass after 45min

3. Discussion

The conductivity and ionization degree of water when one added mint, ginger to water when poured in glass, steel, pride and sometimes copper containers were studied. The changes of water conductivity and ionization degree (see figures 1,2,3,4,5,6,7,8,9,10,11and 12) shows that the conductivity become almost constant when the mint and ginger concentrations increases, then waiting for 15,30 and 45 minutes. For steel the conductivity shows gentle increase. The ionization degree was measured using ammeter (in µA) and voltmeter (in volts). The reading of current shows considerable increase in the ionization degree, while the voltage almost remains constant. This may be related to the fact that the current scale which is in µA is very sensitive to measure any ionization change. The voltage scale which is in volts are very large to detect any small changes. The current reading shows considerable increase of ionization upon increasing mint and ginger concentrations. This is quite obvious, as far as mint and ginger consist of ionized compounds that dissolve themselves in water.

4.Conclusion:

The conductivity, and ionization degree for mint and ginger when poured in pride, steel, glass and plastic containers for different concentration, shows that the conductivity remains almost constant, while the ionization degree increases upon increasing the concentration.

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