Viscosity of Different Waters and Interpretation of Biological Effects

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Abstract

Water is very useful in our daily life. Different waters are taken throughout India and study their Density and Viscosity properties. These waters are placed in Magnetic Field and Electric Field , the changes in Density and Viscosity are noticed and graphs drawn between Density and Viscosity. Biological applications of viscosity are interpreted.

I. INTRODUCTION

Earth contains two thirds of water. Our body also having seventy five percentage of water. Water in our body changes there is a chance to change the viscosity of blood. For this reason we are interested to study the viscosities of different waters. Now we are taking waters from different places in India and try to evaluate the importance and viscosity changes of water.

The water of different samples are taken and determined Viscosity using specially designed Ostwald Viscometer. The flow time is measured with Microcontroller Embedded System and display the output on Liquid Crystal Display.

First we are taken deionized water for that density and viscosity is studied. Deionised water is placed in different types of Magnetic Field [1- 3] a) Un Balanced Magnetic Field (1 + 3) magnets and b) Balanced Magnetic Field (3 + 3) magnets on both sides of viscometer bulb. Each magnet having Magnetic Moment 1. 52 Am^2, we observed the viscosity changes. Then that sample is placed in Electric Field [4 – 11], viscosity effect is studied. Like that we are taking the deionised water from laboratory, the Ganga river water at Kasi, Utter Pradesh state, the Godavari river water at Dhavaleswaram Barriage, West Godavari district in Andhra Pradesh, bore well water at Saraswathi Nagar, Nellore, SPSR Nellore district.

II. RESULTS – DENSITY AND VISCOSITY

The Density [12,13] and Viscosity [14 – 17] of different waters are given in Table 1. The Density versus viscosity curves are shown in Fig. 1. By the application of un balanced and balanced magnetic fields viscosity changes. These values are tabulated in Table 2 and Table 3 respectively. The graph drawn between Density and Viscosity of un balanced magnetic field is shown in Fig. 2 and of Balanced Magnetic Field is shown in Fig. 3. Electric Field of 230 V is applied at the viscometer bulb, the flow time of different waters are taken. The Density and Viscosity values for different waters are noted in Table 4. The Density versus Viscosity curves by the application of Electric Field is shown in Fig. 4.

Table 1 Density and Viscosity of Different Waters

S. No.	Water Name	Collected Place	Density (10^3 Kg m^{-3})	Viscosity (10^{-3} Nsm^{-2})
1	De Ionised	Laboratory	1.oooo	0.935751
2	Ganga	Kasi, U.P. State	1.00196	0.747527
3	Godavari	Dhavaleswaram, A.P. State	1.001568	0.705165
4	Bore Well	Nellore, A.P. State	0.9987595	0.735288

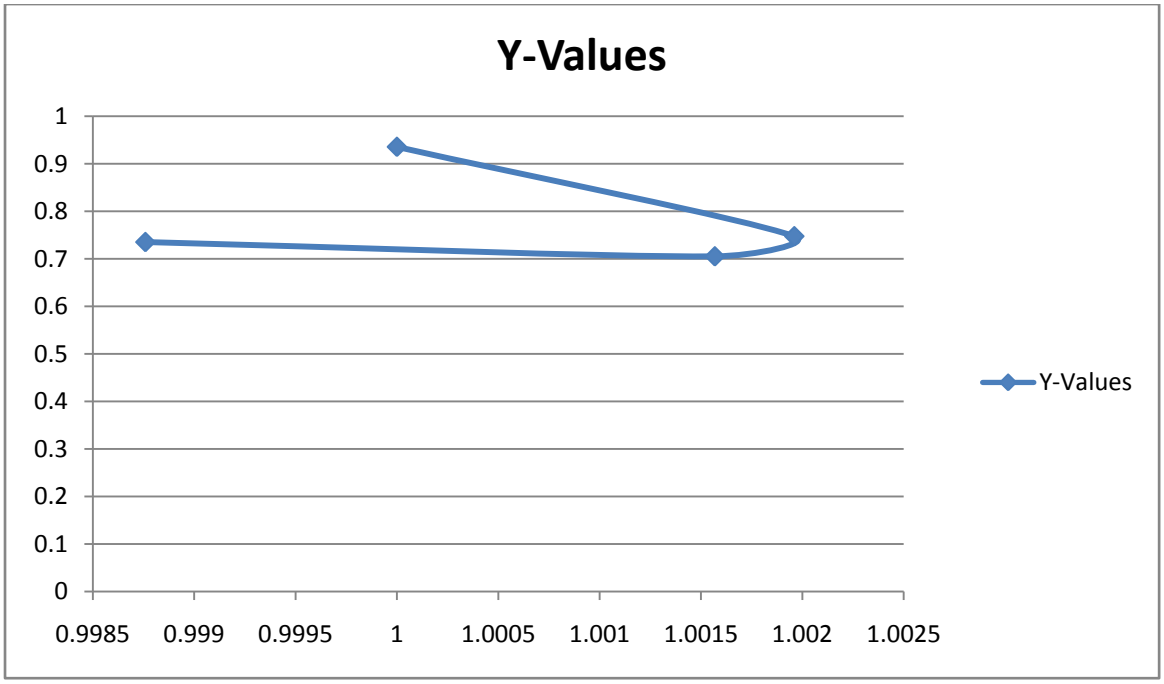

Fig. 1 Density Versus Viscosity of Different Waters

Table 2 UnBalanced Magnetic Field Applied for Different Waters

S. No.	Water Name	Collected Place	Density (10^3 Kg m^{-3})	Viscosity (10^{-3} Nsm^{-2})
1	De Ionised	Laboratory	1.oooo	0.9344664
2	Ganga	Kasi, U.P. State	1.00196	0.7498705
3	Godavari	Dhavaleswaram, A.P. State	1.001568	0.7019200
4	Bore Well	Nellore, A.P. State	0.9987595	0.7195609

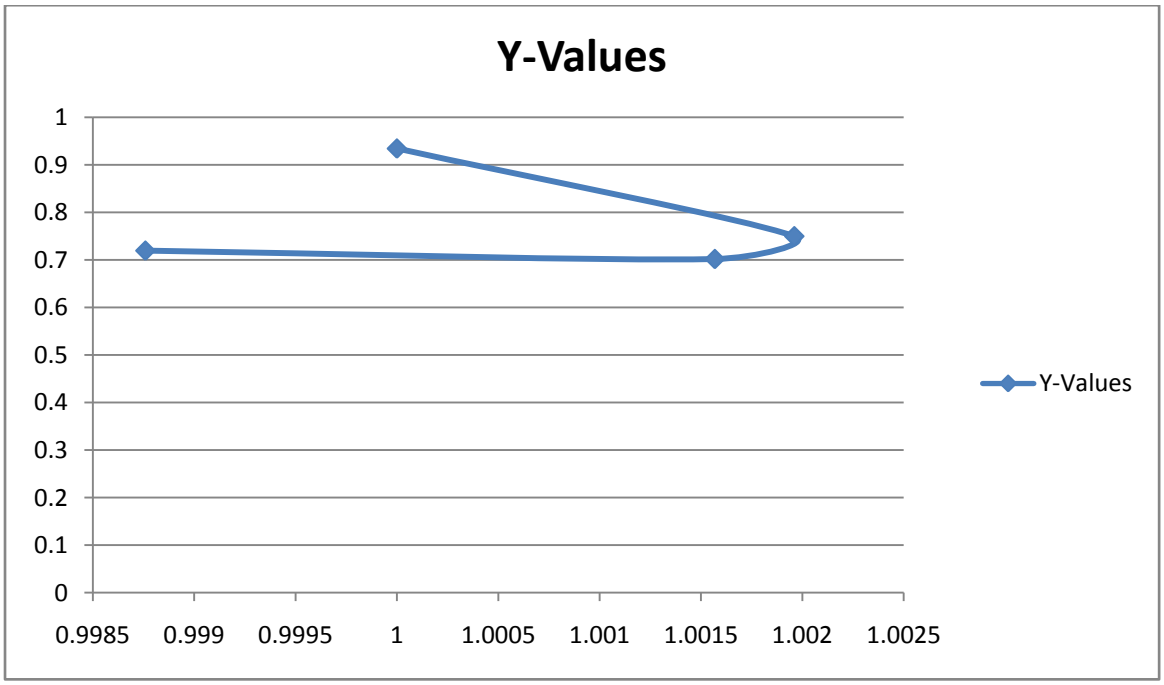

Fig. 2 Density Versus Viscosity Curves for UnBalanced Magnetic Field for Different Waters

Table 3 Balanced Magnetic Field Applied for Different Waters

S. No.	Water Name	Collected Place	Density (10^3 Kg m^{-3})	Viscosity (10^{-3} Nsm^{-2})
1	De Ionised	Laboratory	1.oooo	0.9538965
2	Ganga	Kasi, U.P. State	1.00196	0.7455347
3	Godavari	Dhavaleswaram, A.P. State	1.001568	0.7213504
4	Bore Well	Nellore, A.P. State	0.9987595	0.7193620

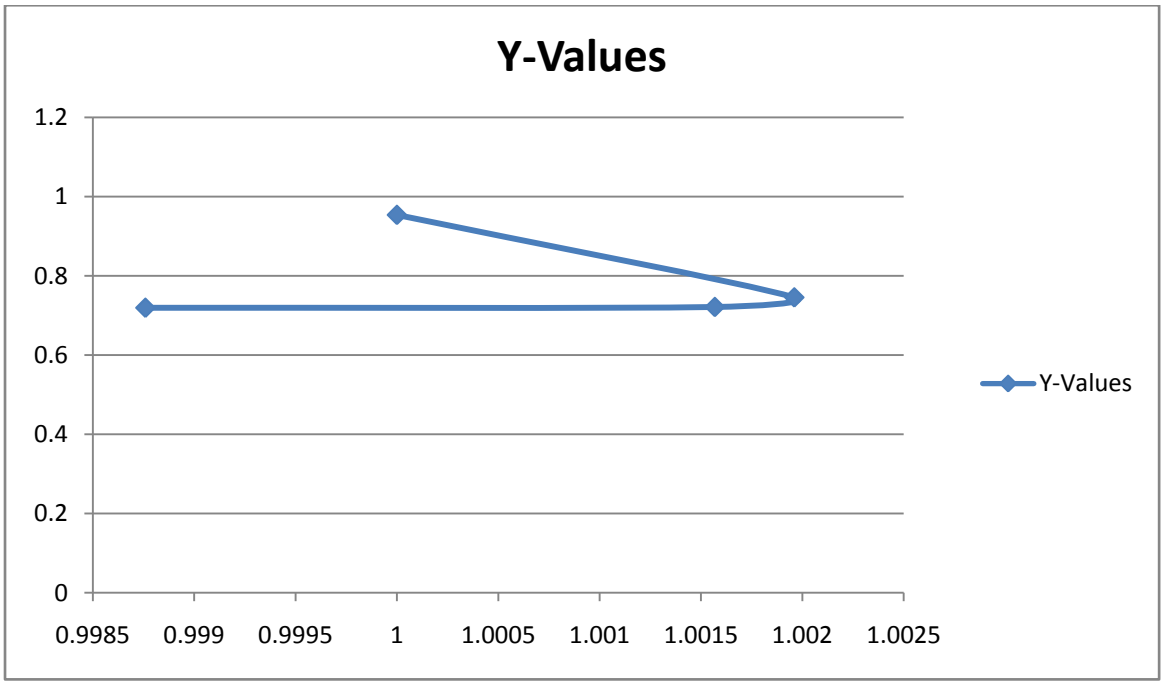

Fig . 3 Density Versus Viscosity Curves for Balanced Magnetic Field

Table 4 Electric Field Applied for Different Waters

S. No.	Water Name	Collected Place	Density (10^3 Kg m^{-3})	Viscosity (10^{-3} Nsm^{-2})
1	De Ionised	Laboratory	1.oooo	0.8552627
2	Ganga	Kasi, U.P. State	1.00196	0.7142018
3	Godavari	Dhavaleswaram, A.P. State	1.001568	0.7322881
4	Bore Well	Nellore, A.P. State	0.9987595	0.712857

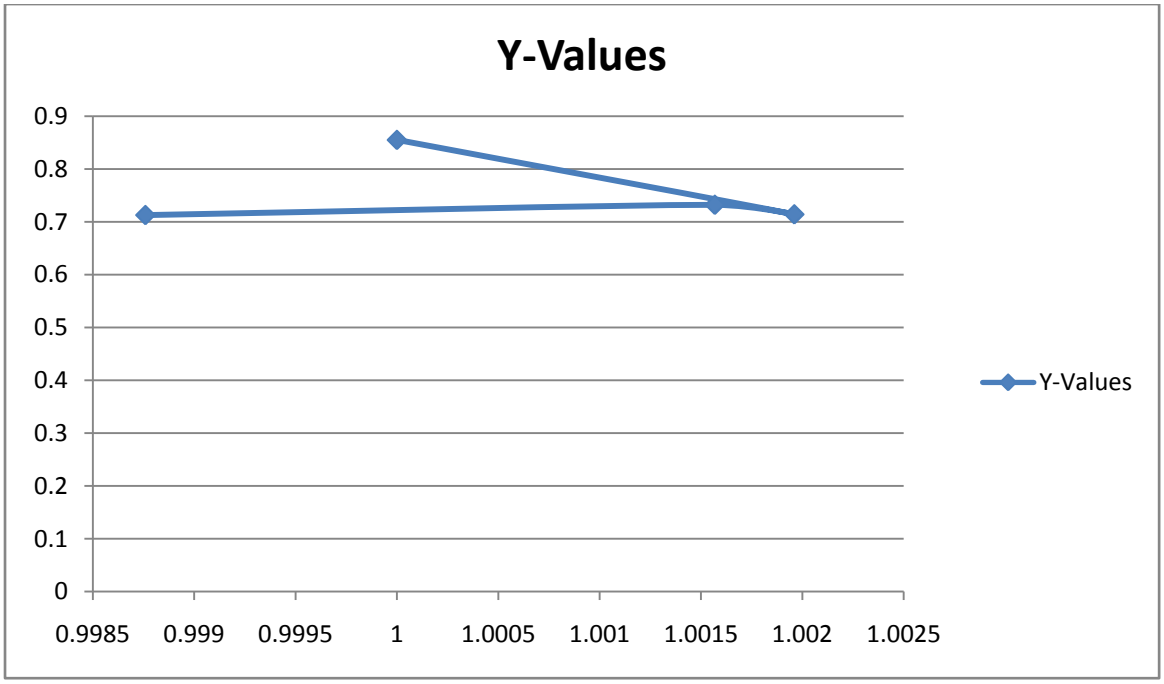

Fig. 4 Density Versus Viscosity Curves for Electric Field

III. INTERPRETATIONS OF BIOLOGICAL APPLICATIONS OF VISCOSITY

By changing the temperature of sea water viscosity is also change.Some aquatic animals and plants are observed in some areas is due to change in viscosity of sea water. For example 10℃ drop (22 ℃ – 12 ℃), swimming speed of larvae of the sand dollar Dendraster excentricus was approximately 40% and water movement was reduced by 35 %, 40 % of the decrease in swimming speed and 55% of decrease in water movement is due to increase in viscosity only [18]. Different waters at different temperatures flowing from poles to equator or equator to poles in sea having different Densities and Viscosities.

The cement paste flow, plastic viscosity and shear yield stress at different water / cement ratios effect the chemical structure on the paste fluidity [19]. This explains that each and every ingradient has its own viscosity and for combination viscosity changes. Like this different rocks in sea and earth having their own constitutions of their ingradients. At the time of volcanic explosion all the ingradients of rocks are combine to form a new type of viscous fluid. After cooling a new type of rock is formed with different ingradients.

Membrane fluidity can affected by a) to heat up membrane and b) to change the pressure. Some drugs like Losartan are also alter the membrane fluidity [20,21]. Yoga give some pressure on heart vessels. so the viscosity of blood changes, particle sedimentation means cholesterol deposition on blood vessels cannot takes place. Membranes of cold acclimated goldfish were more fluid than those of warm acclimated gold fish. By the acclimation treatment the cholesterol content of synaptosomal membrane of goldfish was un affected [22]. In a similar way the pressure and temperature on hill is different from the plain land. Gravity on hill changes due to change in magnetic field of earth. The variation of magnetic field, also affect the viscosity of blood. Due to these changes, a person on hill appears to be smaller and white in color than a person on plain land.

The effect of viscosity on the nasal absorption and biological response to desmopressin, produced a more sustained and slower absorption, with a longer time to maximum plasma concentration [23]. By the addition of alcohol, drug or medicine to a person effect the blood viscosity of a person. The brain cannot receive the correct viscosity of the blood, so a person feels disorders like un stability, unwanted words etc. By the treatment of vitreous haemorrhage and retinal diathermy, a return towards normal of the viscosity was observed in human vitreous, suggesting the presence of local hyaluronic acid production [24].

IV. CONCLUSION

Water Viscosity considerably changes with the application of Magnetic Field and Electric Field. Especially for Deionised water small changes in Magnetic Field effect the flow time. For example take a Fluoride effected water , by the application of Electric Field or Magnetic Field its Viscosity varies. If we maintain the same Field for some time, Viscosity changes continued i.e., fluoride effect may be ignored.

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