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Acoustic, optic and absorption studies of homeopathic dilution aurum metallicum

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Abstract

Homeopathic system of treating disease is always open to criticism and advocated as placebo or based on water memory theory having no scientific basis however experimental works were reported giving a scientific basis of changes that the different dilution have. We are presenting an acoustic, optic and size measurement studies which show the changes in physico-chemical properties of the dilution Aurum Metallicum.

Keywords: Physical and chemical properties, homeopathic dilution, Aurum Mettalicum Absorption spectra, nano-particle

Introduction

The chemistry of liquid solutions has established the fact that the chemical as well as the physical properties of a solution depends on the amount of solute present in the solution. The impurity added to a pure liquid drastically changes its properties and hence its effect.

Homeopathic remedies are also based on the theory of solutions. The remedies are prepared by dissolving a fixed amount of the drug by volume in a given amount (by volume) of pure Ethanol or distilled water and vigorously shaken, called potentization process, after which a given potency is made. A given part of this potency is added in the given amount of pure Ethanol and potentized. The new solution prepared has said to have the next higher potency of the given remedy. The process is repeated and each time a new potency of drug is prepared. Thus in each step of preparing a new potency the solution is further diluted making the amount of drug smaller and smaller. Calculation shows that a potency of 30 of given remedy the number of drug molecule become so small (1 in about 10^{24}) that solution may be regarded as pure liquid. For higher dilution the percentage of drug molecule is even more less but the effectiveness increases rapidly.

Recently a number of research papers are published in different journals of repute [1-8] all of which are in one or other way providing a scientific basis to this alternative method of treating disease. The conclusion one can draw after reviewing these papers is that the Homeopathic system of medicine is not a placebo effect and is based on pure scientific basis and has opened a field of research in which latest theories quantum mechanics, nano-particle physics [9], quantum entanglement can be applied to understand the mechanism of the action not only on human being but also to animals.

We, in this paper, are presenting an ultrasonic and optical investigation of a Homeopathic preparation 'Aurum Mettalicum' of different potencies, of a reputed brand, available in local market. This medicine is selected because of two reasons namely, Aurum Metallicum is prepared from pure gold as the literature of Homeopathy says and first nano-particle formed was of gold and secondly Indian women wear gold ornaments and some how they get the gold nano-particle in their body which may be a reason of their nature compared to their western counterparts.

Methodology

We made use of ultrasonic interferometer, available in the Postgraduate Department of Physics, to measure the velocity of ultrasonic waves travelling through the homeopathic remedy and under proper condition form stationary wave patterns at the frequency of 1MHz produced by single crystal oscillator.

The densities of different dilutions are measured using conventional method of specific gravity bottle and single pan digital balance available with us.

The properties calculated on the basis of above measurements are given in Table 1.

The optical absorption spectroscopic measurements in the ultra-violet, visible and near infrared (Figure 1-4) were made at Advance Science and Technology research center of our Vinoba Bhawe University. The size determination of nano-particles in different dilutions in the background of ethanol (figure 5-8) was also made at Advance Science and Technology research center.

The refractive index measurements were made using Abbe's Refractometer.

Following well established formula [10-12] were used to calculate the different properties of dilutions:

1. Density of the solution ($\rho = \frac{mass}{volume}; \frac{m}{v}$)
2. Speed of ultrasonic wave in liquid ($u = v\lambda$)
3. Acoustic Impedance ($Z = \rho u$)
4. Adiabatic compressibility ($\beta_{adiabatic} = \frac{1}{\rho u^2}$)
5. Intermolecular free path length ($L_{free\ path} = k\beta^{1/2}$)
6. Surface tension ($S = 6.3 \times 10^{-4} \rho u^{3/2}$)

Table 1: The results obtained using Ultrasonic interferometer for the frequency 01 MHz of the ultrasonic waves were as:

Aurum Metallicum Potency → Property ↓	30 °C	200 °C	1M	10M	Ethanol
Density ($Kg\ m^{-3}$)	1015.51	1010.02	1007.66	1007.64	810
Acoustic Velocity ($m\ s^{-1}$)	1226.4	1223.8	1193.8	1186.7	1018.6
Acou. Impedance ($\times 10^4\ Kg\ m^{-2}\ s^{-1}$)	124.54	123.60	120.29	119.57	82.51
ADIAB. Compressibility ($\times 10^{-10}\ N^{-1}\ m^2$)	6.547	6.610	6.963	7.047	119
Intermo. Free Path ($\times 10^{-12}\ m$)	51.12	50.74	52.08	52.30	21.53
Surface tension ($N\ m^{-1}$)	27477.24	27239.6	26183.8	25952.3	16589.0
Refractive Index μ	1.378	1.370	1.369	1.365	1.375

The absorption spectra for different dilutions were as

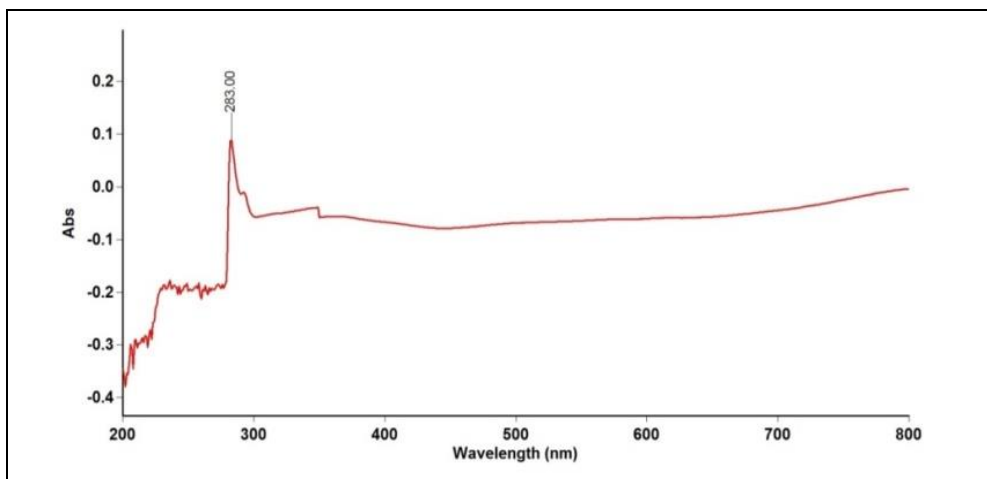


Fig 1: AURUM MET-30 °C

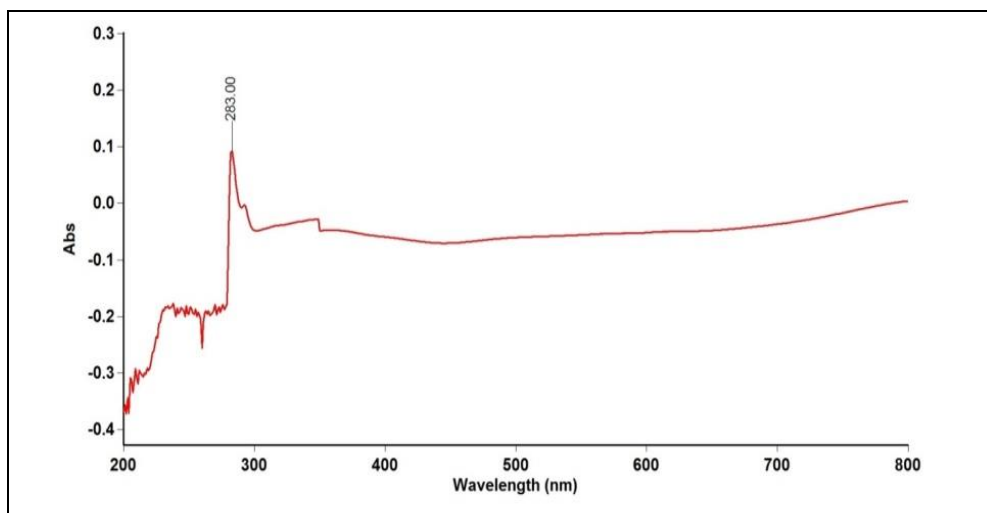


Fig 2: AURUM MET-200 °C

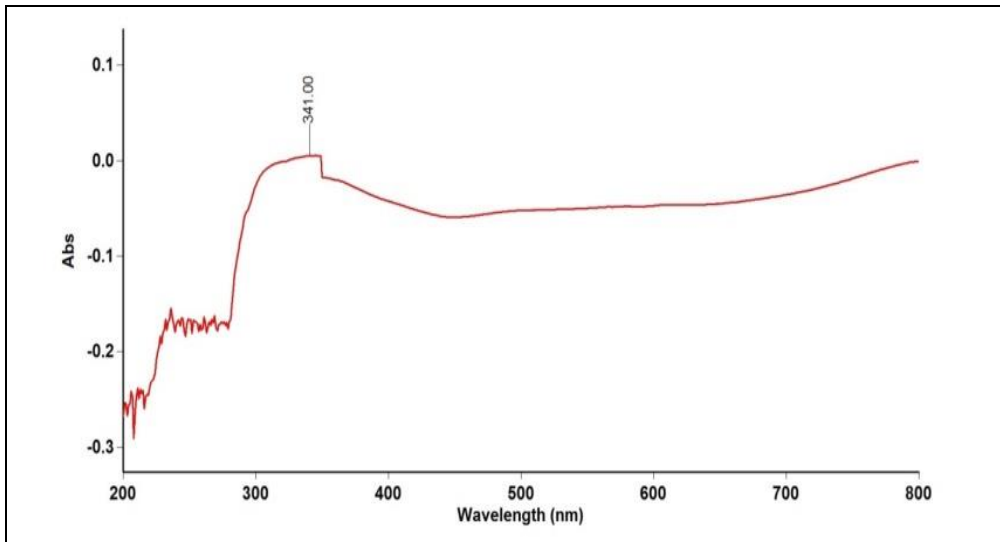


Fig 3: AURUM MET-1M

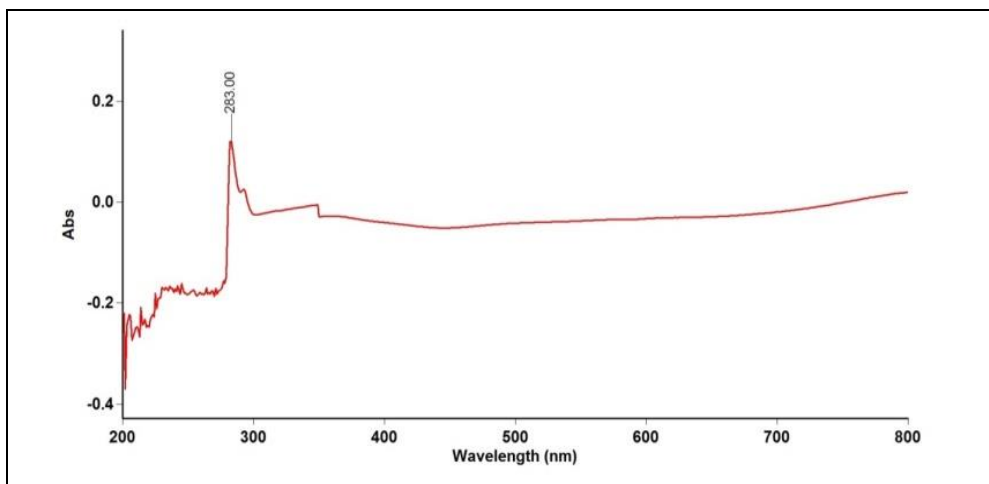


Fig 4: AURUM MET-10M

From the above optical absorption spectra it can easily be concluded that even in the higher dilutions of medicine, the drug molecule is present and is responsible for curative actions. The size measurements of nano-particle present in different dilutions is also suggestive of the fact that drug

molecules are present in the different dilutions. The existence of nano-particle in Homeopathic medicine has also been reported recently by a group of researchers of IIT Bombay in their paper^[13]. The results that we obtained were as

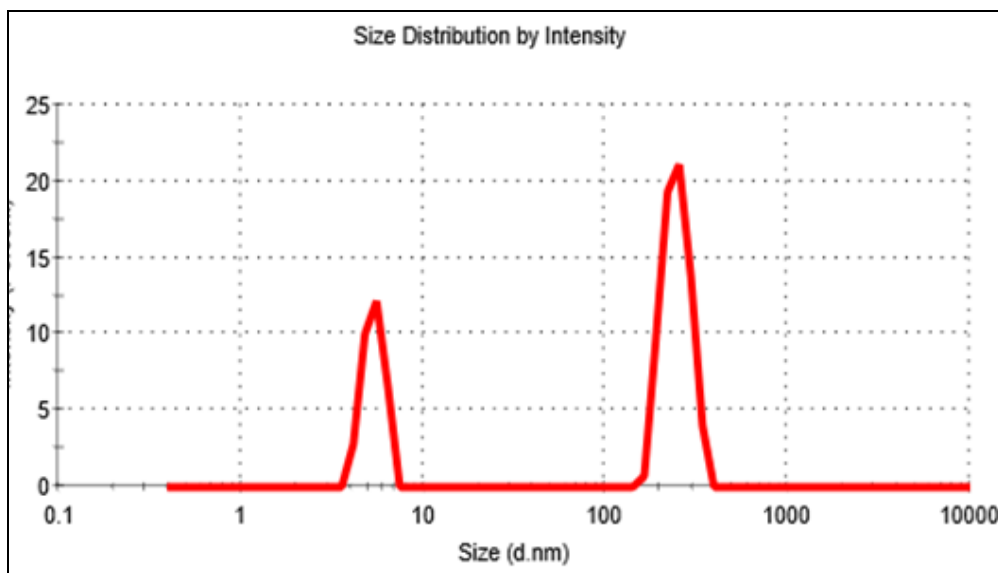


Fig 5: AURUM MET-30C

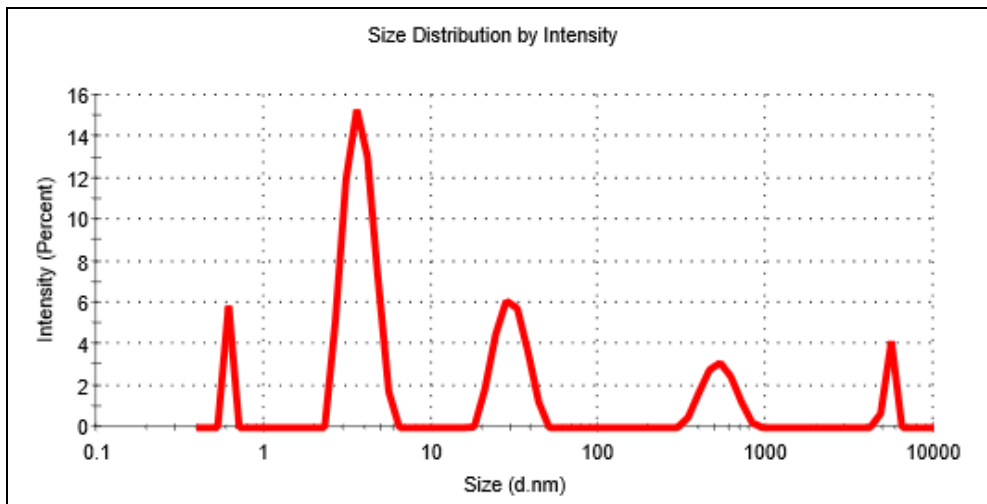


Fig 6: AURUM MET-200 °C

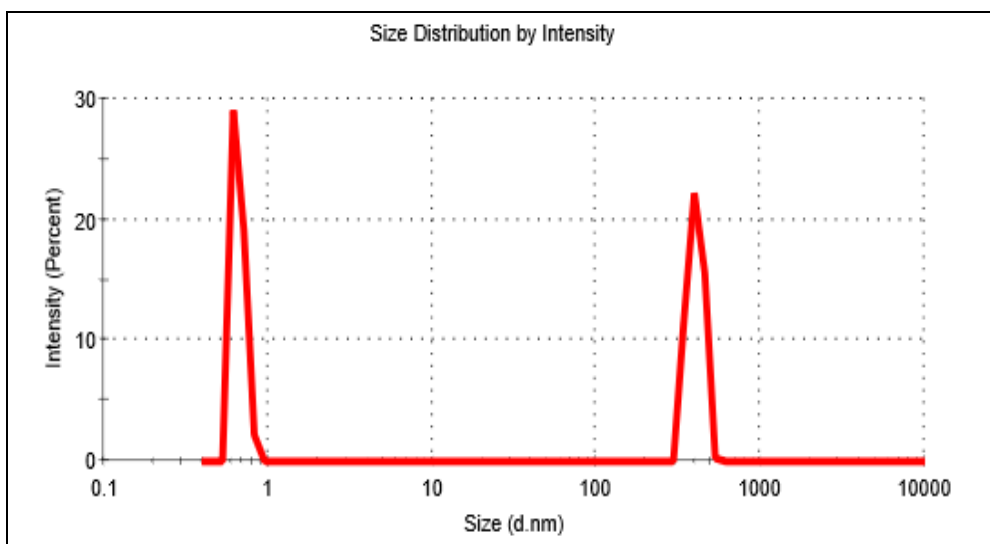


Fig 7: AURUM MET-1M

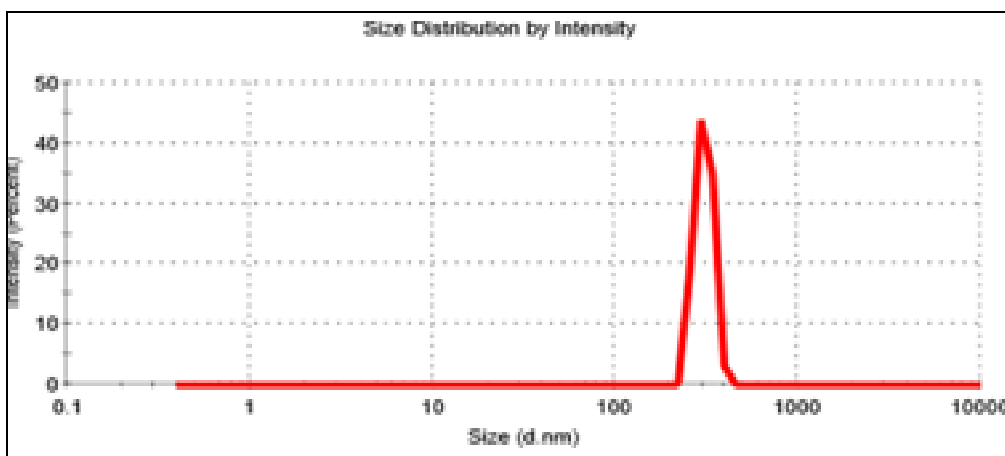


Fig 8: AURUM MET-10M

Conclusion

We observed a marked change in the physico-chemical properties of the dilution. The increase in dilution produces change in the wave length of the ultrasonic wave, the velocity and in the acoustic impedance of the medium through which ultrasonic wave is passed. The adiabatic compressibility, intermolecular free path length as well as the refractive index measurements showed a marked

change. The absorption spectra and the nano-particle size measurements also confirm the changes.

The observed changes in different properties may be the reason of action of the drug in curing the disease. The reports published in ‘The Australian Report’ [14] is suggestive of the fact that Homeopathic System of Medicine has some scientific basis and is effective in curing the disease.

The ultrasonic studies and the absorption spectra along with size measurement studies, of the selected homeopathic medicine, reveals a marked change in the physico-chemical properties of the diluted solution. As dilution increases the physical parameters like density, acoustic wavelength, acoustic impedance, compressibility as well as chemical properties like concentration gradient, intermolecular free path length etc. changes. These changes might be responsible for the effectiveness or action of the drug to treat a disease as suggested by the reports published in 'The Australian Report'^[14] also establishes the fact that homeopathic medicine science is effective in treating the disease.

Future work

A thorough theoretical investigation using the ideas of quantum theory of solutions, theory of nano-particles, quantum entanglement theory and quasi-quantum theory is suggested.

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References

1. Elia V, Elia L, Marchettini N, Napoli E, Tiezzi E. Physicochemical properties of aqueous extremely diluted solutions relating to aging. *J Therm Anal Calorim.* 2008;93:1003-1011.
2. Maurya VN, Arora DK, Maurya AK, Gautam RA. Measurement of ultrasonic velocity, density and refractive index of liquids using experimental techniques. *World of Science Journal*; c2003, 2.
3. Maity T, Ghosh D, Mahata CR. Theory and instrumentation related to potencies homeopathic medicines. *Indian J Res Homeopathy.* 2008;2:1-5.
4. Maity T, Ghosh D, Mahata CR. Effect of dielectric dispersion on potencies homeopathic medicines. *Homeopathy.* 2010;99:99-103.
5. Nain AK, Droliya P, Manchanda RK, Khurana A, Nayak D. Physicochemical studies of extremely diluted solutions of Sulphur in Ethanol by using volumetric, acoustic, viscometric and refractive index measurements at different temperatures. *J Mol Liquids.* 2015;211:1082-1094.
6. Nain AK, Droliya P, Manchanda RK, Khurana A, Nayak D. Physicochemical studies of extremely diluted solution of *acidium salicylium* in ethanol by using volumetric, acoustic, viscometric and refractive index measurements at 298.15K; 308.15K and 318.15 K. *J Mol Liquids.* 2016;215:680-690.
7. Jayamadhuri N, Glory J, Subramanyam Naidu P, Ravindra Prasad K. Ultrasonic studies in the solutions of three hydrate drugs in methanol. *J Atoms and Molecules.* 2013;3(2):492-504.
8. VaradaRajulu A, Mabu Sab P. *Bull. Mater. Sci.* 1995 Jun;18(3):247-253.
9. Pandey RK, Kumar D, Sinha RN. Ultrasonic studies of the homeopathic formulation Arnica Montana in Ethanol. *Int J Basic Appl Research.* 2018;8(7).
10. Das SK, Schoi SU, Yu W, Pradeep T. *Nanofluids: Science and Technology.* Wiley Inter Science; c2007. p. 397.
11. Rajulu VA, Sab MP. *Bull. Mater. Sci.* 1993;5(3):247-253.
12. Nikam PS, Hasan M. *Asian J Chem.* 1993;5(2):319-321.
13. Syal VK, Gautam R, Chauhan S. *Ind J Pure & Appl Physics.* 1998;36:108-112.
14. Chikrmane PS, Suresh AK, Bellare JR, Kane SG. Extreme homeopathic dilutions retain starting materials: A nano-particulate perspective. *Homeopathy.* 2010 Oct;99(4):231-242.
15. The Australian Report. 26 August 2019. Prof Anne Kelso's report in NHMRC, Homeopathic Research Institute.

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