Unraveling the Low Frequency Triggered Electromagnetic Signatures in Potentized Homeopathic Medicine

Hari N. Bhargaw (bhargawhnb1@gmail.com)
CSIR-Advanced Materials and Processes Research Institute, Bhopal, Madhya Pradesh-462026
Nisanth Nambison
Government Homeopathic Medical College and Hospital, Bhopal, Madhya Pradesh
Manoj Gupta
CSIR-Advanced Materials and Processes Research Institute, Bhopal, Madhya Pradesh-462026
Mohit Sharma
CSIR-Advanced Materials and Processes Research Institute, Bhopal, Madhya Pradesh-462026
Avanish Srivastava
CSIR-Advanced Materials and Processes Research Institute, Bhopal, Madhya Pradesh-462026
Prabhat Baghel
CSIR-Advanced Materials and Processes Research Institute, Bhopal, Madhya Pradesh-462026
Meraj Ahmed
CSIR-Advanced Materials and Processes Research Institute, Bhopal, Madhya Pradesh-462026
Mahendra Jadhav
CSIR-Advanced Materials and Processes Research Institute, Bhopal, Madhya Pradesh-462026
Khushwant Gavel
CSIR-Advanced Materials and Processes Research Institute, Bhopal, Madhya Pradesh-462026

Research Article

Keywords: Homeopathic medicine, Potency classification, Electromagnetic signatures, Low frequency excitation

Posted Date: December 6th, 2021

DOI: https://doi.org/10.21203/rs.3.rs-1105979/v1

Abstract

In the present work, a novel experimental tool was developed to precisely measure the potency levels in various homeopathic medicines, under various excitation frequencies. Electromagnetic responses (output voltages) are detected from the homeopathic medicines in different potencies. These unique electromagnetic responses were captured using an electromagnetic coil at 300 Hz and 4.8 kHz for each potency level developed in-house. Different potencies of Homeopathic medicine Ferrum Metallicum (FM-1X to FM-6X), prepared with α-lactose monohydrate as its base, exhibited significant and distinct electromagnetic signals. At high excitation frequency, the output signal voltage from high homeopathic potencies had a better resolution compared to the signal obtained at lower frequency. The electromagnetic signal of various homeopathic medicines was also measured, and a distinct output voltage corresponding to each potency level was detected. Our experimental results confirmed that each homeopathic medicine has characteristic electromagnetic signals under excitation/resonance frequency. The results not only provide scientific evidence to easily classify the homeopathic medicine potency but, also helps to understand the science behind the curative action in terms of photon emission of homeopathic medicines.

1.0 Introduction

Homeopathy is a medical system postulated by German physician Samuel Hahnemann in his textbook of homeopathy, first published in 1810. This book provides theoretical and practical instructions for practicing the new mode of treatment, developed by him in the previous twenty years [1, 2, 3]. Homeopathy gained popular attention due to the fact that homeopathy was thought to be safe and harmless, especially no adverse effects were reported[4]. Hahnemann put forward the idea, if a substance is capable of generating an artificial disease in a healthy person, that substance should also be able to cure a similar disease in a sick person[5]. Later, Hahnemann proposed this principle of similarity as pre-scientific evidence or support for his theory. Many physicians, strongly influenced by his concept of the principle of similarity, also known as the law of similar [6, 7]. To confirm the concept, homeopathic drugs were tested on healthy individuals, and the symptoms they developed after taking the drugs were observed and noted down. It was suggested that this drug substance would equally be suitable as a curative remedy for patients who exhibited similar symptoms. Since these drug substances were not tested for treating disease by pathological names, the law of similarity was not accepted by the scientists of modern medicine [8, 9]. In addition, despite the popularity of homeopathy, it has come into conflict with science and modern medicine, due to a lack of experimental evidence of the science behind the action of homeopathic remedies and the non-clarity of its healing mechanism [10]. Moreover, due to the highly diluted nature of homeopathic drug substances, very limited appropriate scientific tools are available for characterization and analyzing the mechanism of homeopathic medicinal action. Hahnemann claimed that undiluted doses of drug substances could cause dangerous reactions, and thus the preparations are given in the lowest possible dose [11, 12, 13]. A more dilute solution is said as having a higher "potency" and thus is claimed to be stronger and deeper-acting [14]. The general method of preparation of homeopathic

medicine is serial dilution and agitation, where the solvent is added to part of the previous mixture and insoluble solids, such as iron, silver, granite, diamond, and platinum, are diluted by grinding them with α-lactose monohydrate (milk sugar) ("trituration")[15,16]. Mostly, three logarithmic dilution scales are used in homeopathy. Hahnemann created the "centesimal" or "C scale", diluting a substance by a factor of 100 at each stage followed by mechanical agitation through physical strokes. There is also a decimal dilution scale (notated as "X" or "D") in which the preparation is ground and diluted by a factor of 10 at each stage [17], whereas in quintamillesimal (LM) scale the drug 1 part is diluted and agitated in 50,000 [18,19,20]. Since potencies are the key to homeopathic medicine and it has an important role to play in curing diseases, however, no effective tool or methods were developed to identify the homeopathic potencies to this date. Recently, it was proposed that homeopathic medicines may produce the electromagnetic signal or signature of a natural substance that was used to prepare the serially diluted homeopathic potencies [21,22]. It has also been reported that diseases change the electromagnetic properties of the diseased cells, tissues, and organs, and the electromagnetic signal that generates from these homeopathic potencies either provokes the body's defense to act or cancels the pathological frequency causing illness in the body. However, due to the highly diluted nature of homeopathic potency, the probability of finding even a single molecule of the starting source material in the final homeopathic solution (dilution ratio ~ 10^{-30}) tends to zero, it is very difficult to detect electromagnetic wave or magnetic photon in such solutions. Therefore, the transfer phenomena of the medicinal information to the solution and the living organism are still unclear. Recently, various other models of mechanisms of action based on the imprint of supramolecular structures, nanoparticle-allostatic, cross-adaptation-sensitization (NPCAS) model; the theory of non-molecular electromagnetic transfer of information, based on the coherent water domains model, and relying on the idea of local interactions were proposed by researchers[23,24,25,26,27]. Moreover, Iris R Bell *et al* have also reported that homeopathic medicine may contain measurable sources and silica nanoparticles heterogeneously dispersed in colloidal solution. These may act by modulating the biological function of the allostatic stress response network and evoke biphasic actions on living systems via organism-dependent adaptive and endogenously amplified effects which finally improve systemic resilience [28]. Moreover, at high potency (beyond 12C) homeopathic medicines don't even have traces of the starting materials, but, they may still cure diseases. To support the working concept, a quantum electrodynamics mechanism based on the existence of ice-like structures called coherent domains (CD) in water at room temperature was proposed [29,30,31]. These CDs act as information carriers through serial dilution, because their shape and size get influenced by many factors like impurities, ions of other substances, large foreign molecules, physical perturbations, electromagnetic fields, etc. In addition, quantum entanglement as a working mechanism for the homeopathic potencies is also reported, where when the particles such as the photons, electrons, molecules interact and then separate, the pair of particles on entanglement has its own defined quantum state [32]. Homeopathic medicine can be thought of as an entangled state between the medicine, original substance, and patient's symptomology. Similarly, Montagnier *et al.* [33–35] have shown that some of the bacterial and viral DNA sequences induce low-frequency electromagnetic waves in high aqueous water solutions and they measured the electromagnetic signals in water decimal dilutions of DNA. In most of the reported

mechanisms, the electromagnetic wave and magnetic field have played a huge role, but the origin of magnetism/electromagnetic wave has not been reported till date.

In the present work, a simplified electromagnetic copper-based coil developed in-house has been designed to induce the magnetic field under controlled current and voltage. The homeopathic medicines with various potencies are tested under a magnetic field and have been characterized according to their output resonance voltages. Significant changes in the magnetic field were detected in the lower and higher potencies of the same medicine. These changes were also quite significant in the different medicines of similar potency. The work brings out a low-frequency electromagnetic copper-based coil system developed in-house capable of characterizing different homeopathic potencies, which may perhaps be unattainable from the other characterization tools. Raman spectroscopy, FTIR techniques were also employed to investigate the structural, vibrational information of the potencies but only partial characterization results were obtained.

2.0 Materials And Methods

Insoluble original substances were serially ground with α-lactose monohydrate (milk sugar) in preparing the homeopathic medicines [36]. Different compositions of samples of different potencies of 1X, 2X, 3X, 4X, 5X, and 6X were prepared as per the standard protocol of homeopathic medicine preparation. The Ferrum Metallicum (FM), Zincum Metallicum (ZM), Argentum Metallicum (AM), Alumina, Antim-Tart, and Plumbum Metallicum (PM) were used as homeopathic medicine with α-lactose monohydrate as base material. A standard vial of cylindrical shape with 5.6 gram (by weight) of homeopathic medicine was used for each potency, for each type of homeopathic medicine. Three different samples from each homeopathic medicine were measured and the average value of the output voltages has been reported. Electromagnetic (EM) signals of homeopathic test samples were measured under various excitation fields such as an electromagnetic field of uniform power spectral density over a frequency spread[37]. The experimental setup is shown in Figure 1, which consists of a function generator, excitation coil, and sensing probe, Mu-metal shielding box, spectrum analyzer, and computer-based data acquisition system. The excitation signal of the selected frequency range was supplied from the function generator to the excitation coil. The generated EM signal from the excitation coil passed through the test sample and the response of the sample was recorded by the sensing probe. Generally, mu-metal made from the nickel-iron-based soft ferromagnetic alloy with very high permeability was used as shielding material against stray magnetic field [38, 39]. An excitation coil was indigenously developed having 300-ohm impedance and a sensing probe (Aaronia AG, Germany) was used to acquire the response signal. The excitation coil and sensing probe were aligned axially concentric for maximum coupling of signals, which were placed at the centroid of the Mu-metal shielding box (as shown in Figure-1) to avoid EM interferences. The sensing signal was captured, analyzed, and processed to extract the required frequency spectrum information of the samples. The homeopathic medicine samples were also analyzed by the Raman spectrometer and FT-IR and comparative results were shown of different medicines with different potencies.

[IMAGE-C:\Workspace\ACDC\ImageHandler\81

3.0 Results And Discussion

Figure 2. SEM image of the (a) lactose (sugar of milk) and (b) Ferrum Metallicum-1X homeopathic sample, (c) Ferrum Metallicum-6X homeopathic sample, (d) Ferrum Metallicum-1X homeopathic sample labeled with particle size, (e) EDS analysis of sample and (f) Elemental analysis of Ferrum Metallicum-1X sample.

3.1 Homeopathic potency measurement

To probe the electromagnetic signature generated from the homeopathic medicine samples prepared of FM-1X to FM-6X potencies. Initially at the low excitation frequency was used to trigger the homeopathic medicine samples. Figure 3a shows the variation of the output voltage detected from the test samples at 300 Hz excitation frequency. It is clear from Figure 3a, that the output voltage of about 65.62 μV was produced from the FM-1X homeopathy under a frequency of 300 Hz. It was observed that the increase in the potency of FM homeopathic medicine from 1X to 6X, the output response voltage under magnetic field gets reduced. Figure 3 also shows the output voltage generated from the homeopathic medicine samples of FM-1X, FM-2X, FM-3X, FM-4X, FM-5X, and FM-6X potencies. The output voltage signals obtained were of the order of 65.62, 64.24, 63.65, 63.46, 63.16, 63.13 μV, respectively. This is the first experimental investigation of the homeopathic medicine samples under a low-frequency excitation (300 Hz) electromagnetic field. The decrease in the output voltage at higher potencies of the homeopathic medicine is related to the concentration and morphology of the FM homeopathic medicine. The low output voltage at high potencies may be attributed to the low concentration of FM in the 6X potencies. It is worth pointing out that the base α-lactose monohydrate used in the preparation of homeopathic medicine does not exhibit any magnetic property. Despite the absence of magnetic property of homeopathic medicine, the generation of the output voltage at a certain resonance frequency shows that homeopathic medicine has a healing mechanism associated with it. Moreover, the clear detection of output voltage from various potencies FM-1X to FM-6X proves the importance of electromagnetic resonance-based detection of homeopathic medicines with different potencies. However, the output voltage signal received from the low potencies of FM-5X and FM-6X almost coincided at excitation frequency (Fig. 3b). It was also reported that excitation frequency (resonance) strongly influenced the output voltage or electromagnetic response from the homeopathic potencies. It can be clearly observed that the homeopathic potencies have a larger difference in the successive homeopathic potency peak voltages. The largest difference in the peak voltage was observed in the case of the 1X and 2X potencies. This difference reduces as the potency level increased from 1X to 6X. The difference became almost insignificant in 5X and 6X potencies as seen in Figure 3b. Thus, it may be pointed here that as the homeopathic potency increases they may be required to get excited at higher resonating frequencies. Therefore, to better resolve the higher potency, the investigation was conducted for the identification of an appropriate upper range of lower excitation frequency.

Figure 3. (a) Electromagnetic signals/output voltage from various Ferrum Metallicum samples under excitation frequency of 300 Hz and (b) an enlarged view of the Electromagnetic signals/output voltage

displaying a small noticeable difference between 5X and 6X potencies. The output voltage from the FM-1X, FM-4X, and FM-6X are measured under various frequencies ranging from 300 Hz to 60 kHz. Figure 4 shows the variation of the output voltage under different excitation frequencies. The output curve indicates that the output voltage generated from each FM sample varies with the applied frequency. However, the output voltage increases with the frequency and the response curve almost flattens from 3 kHz to 8 kHz. The response curve of the potencies maintained constant differences in this frequency range. However, the difference starts to fluctuate as the frequency is increased beyond 4.8 kHz. Thus, the excitation frequency was selected for further investigation to resolve the higher potencies.

Figure 4. Electromagnetic signals/output voltage from Ferrum Metallicum sample of different potencies at various frequency ranging from 300 Hz to 60000 Hz.

Figure 5. (a) Electromagnetic signals/output voltage from Ferrum Metallicum sample under excitation frequency of 4.8 kHz and (b) an enlarged view of the Electromagnetic signals/output voltage displaying a larger noticeable difference between 5X and 6X potencies.

To further investigate the electromagnetic signature in different homeopathic medicines at 4.8KHz excitation frequency, a set of 3X potencies medicine samples such as Zincum Metallicum (ZM), Argentum Metallicum (AM), Alumina (AL), Antim-Tart (AT), Ferrum Metallicum (FM) and Plumbum Metallicum (PM) are prepared. Figure 6 shows the generated electromagnetic signal from the medicine sample ZM-3X, AM-3X, AL-3X, AT-3X, FM-3X and PM-3X, respectively. The obtained voltage signals were of the order of 148.40, 148.44, 148.87, 149.00, 149.80, 150.65 μV, respectively. The result clearly suggests that each homeopathic medicine has distinct characteristic electromagnetic property and thus, generated different output voltage prepared through a similar standard protocol of homeopathic medicinal preparation.

Figure 6. Electromagnetic signals/output voltage from various homeopathy sample under excitation frequency of 4.8 kHz.

The important results obtained were that each of the homeopathic potency generates a characteristic signal in each case whether the starting materials are of a magnetic or non-magnetic nature. The theory suggested by Lenger[40] that the succussion and vibrations during the preparation of the homeopathic potency lead to the generation of the electromagnetic property in the homeopathic potency. Hence, it can thus be proved that the succussion and vibrations during the preparation of the homeopathic medicines lead to the generation of a magnetic character in each of the homeopathic potency. The homeopathic medicine photons are bound by the magnetic field of the base material i.e. α-lactose monohydrate (milk sugar). However, it is also important to discuss about the strength of the signals obtained in each case. The strength of the signal is highest for homeopathic medicine prepared from Plumbum Metallicum followed by Ferrum Metallicum, Antim Tart, Alumina, Argentum, and Zincum Metallicum. The strength of the magnetic signal was lowest for the Zincum Met medicine. The variation of the electromagnetic signals in different samples may be related to the nature of metal properties used to prepare the

homeopathy medicine. It is very interesting to note that Plumbum Metallicum contains the Pb element which is a heavy element (High atomic mass of metals compared to other homeopathy samples) and it usually shows the diamagnetic property, however, in the present investigation its homeopathy sample shows high electromagnetic signal.

Further, Ferrum Metallicum medicine contains the Fe element which is ferromagnetic in nature and thus exhibits high electromagnetic signal than other medicine samples except for Pb-based homeopathy samples. Antim Tart medicine is prepared with antimony and potassium metals, where antimony usually belongs to the diamagnetic and potassium as the ferroelectric class of materials. Therefore, observation of significant electromagnetic signals from Antim Tart is may be due to their coupled magnetic properties. The aluminum-based homeopathy medicine shows a lower magnetic signal than Antim tart homeopathy medicine, which is ascribed due to the paramagnetic properties of the Al element. Further, an electromagnetic signal of 148.4 and 148.3 μV were observed from Argentum met and Zinc met-based homeopathy samples, respectively. These values are very close and lower than other electromagnetic signals observed from another homeopathy medicine. Such behavior is due to their diamagnetic properties and almost similar value of magnetic susceptibility (χ_m) of the Ag (~ 19.5 x 10^{-6} cm^3 mol^{-1}) and Zn (-9.15 x 10^{-6} cm^3 mol^{-1}) elements which are used to prepare their homeopathy medicine[41]. It is worth pointing out that although various homeopathy samples contained diamagnetic materials but they showed significant electromagnetic signals even under excitation of even low frequency.

Our finding indicates that each of the homeopathic medicine has a different characteristic voltage and during illness, change in the character of bio-photons in the body disturbs the electromagnetic field of a patient. Each of the patients has different micro-voltages/frequency generation from the living organs in the body according to their illness. When the homeopathic medicine is consumed by an ill patient, the photons are released from the base material on interaction with the micro-voltages present in the body. Each of the homeopathic medicine releases the photons at a particular frequency and voltage to bring back the equilibrium in the disturbed bio-photon according to the principle of resonance[40].

Therefore, our finding of the existence of the electromagnetic signals from homeopathic medicine under magnetic field will play an important role not only inefficiently detecting and categorizing the homeopathic medicine with different potencies, but it will also help to understand the science behind the mechanism of the pathway of healing due to homeopathic medicines in the human body. Moreover, observation of distinct output voltage from different homeopathic medicine prepared with different potencies confirmed that each potency has different energy levels. Therefore, the degree of homeopathic potencies may also be measured by the indigenously developed system.

The present study also supports the fact that electromagnetic signal generated under low frequency from homeopathic potencies provokes the body’s defense to act or cancels the pathological frequency disturbing the body and therefore curing the disease, as diseases change the electromagnetic properties of the cells, tissues and living organs of a biological system.

3.2 Raman Measurements: Raman spectroscopy provides a powerful tool to characterize the structure of various kinds of materials, structural changes and it is widely used to characterize the defects in the materials. Various information such as interactions among the functional groups, chain orientation, and their interfacial properties can be also revealed from the Raman spectroscopy analysis. In the present study, we have recorded the Raman spectra (Figure 7) of FM potencies prepared with α-lactose monohydrate as its base, samples under wavenumber region of 100-1400 cm $^{-1}$. Various Raman peaks in the low-frequency range at 194, 357, 374, 439, and 475 cm^{-1} and Raman peak at higher wavenumber at 525, 850, 918,1022, and 1088 cm^{-1} were detected. The major Raman peaks that appeared at 357, 918 cm^{-1}, 1022 cm^{-1}, and 1088 cm^{-1} are considered the Raman fingerprints of α-lactose monohydrate. The potencies with different concentrations of 1X, 2X, 3X, 4X, 5X, and 6X samples also exhibited identical Raman peaks with minor variation and major peaks were of α-lactose monohydrate (milk sugar). To further observe the changes, we carefully analyzed the Raman of α-lactose monohydrate and Ferrum Met sample in the same frequency region.

Figure 7. Raman spectroscopy analysis of (a) lactose based and Ferrum Met homeopathic medicines of 1X-6X potency, and (b) enlarged view of the Raman peaks

The Raman peak observed below 500 cm^{-1} (such as 357, 374, 439, and 475 cm^{-1}) is attributed to the endocyclic vibrations of the ring. The peak at 439 cm^{-1} could be assigned to the endocyclic C-C-O bending-mode and the band that appeared at 374 cm^{-1} is due to the C-C-C bending, and a low intense peak was observed in all samples at 357 cm^{-1} corresponds to the C-5-0-5-C-1. Moreover, the sharp Raman lines observed at 1120 and 1088 cm^{-1} are related to the D-glucose (lactose) and D-fructose, which occurs due to the C-OH bending-mode and the C-O stretching mode. The band that occurred at 474 cm^{-1} may be assigned to the C-C-C bending modes of the o-fructosyl moiety, whereas 439 cm^{-1} could be assigned to the C-C-C mode of the D-glucosyl moiety. The perturbation and slight change in the peak intensity at various bands could probably be explained by the change in the concentration, which is associated, with the hydrogen bonding, of the OH groups. The Raman peak observed at 918 cm^{-1} frequencies can be assigned to the bending of C-H, which was found in the D-glucose and D-fructose and related to the deformation of C-1-H in D-glucose. Another characteristic vibration of this linkage is the C-O-C bending-mode, which is appeared at 374 cm^{-1} and is associated with the spectra of D-glucose and D-fructose. It is interesting to note that a sharp peak at 876 cm^{-1} was detected from the potencies (1X - 6X) sample. However, this peak does not appear in the lactose sample. As discussed in the previous section, Ferrum potencies are used with the lactose samples to prepare the homeopathic medicine. Due to the standard sample preparation procedure, the concentration of the Ferrum (Fe_2O_3) was very less and it was very difficult to detect the intense peak in the Raman spectra. However, a high-intensity peak near 876 cm^{-1} was detected in the Raman spectra of potencies (1X to 6X). Few other very minor intense peaks at 173, 189, 257, 286, and one small intense peak at 701 cm^{-1} are detected. Fe_2O_3 belongs to the hematite and R-3c crystal space group. Usually, in Raman spectra, two $A1_g$ phonon modes and five E_g phonon modes are expected.

In the present case, the peaks at 173, 189 cm^{-1} are associated with the $A1_g$ phonon mode, and the observed peak at 173, 189 cm^{-1} corresponds to T2g modes while the peaks at 289 and 701 cm^{-1} is related to Eg phonon modes. Surprisingly, an intense peak as detected at 876 cm^{-1} is not directly related to the iron particles, however, the existence of this peak may be understood by considering the effect of oxidation of magnetite while performing the Raman experiments. A similar observation was also reported in the previous study [reference missing], and it was reported that such peaks are observed due to the formation of residual iron oxides during the magnetite formation the phase transformation of magnetite. The changes in the Raman intensity and peak position are related to the broken hydrogen bonds that act as medicinal memory in highly diluted medicine in different potencies, thought to play an important role in the pathological healing pathways, through the generation of the associated voltage in the human body.

3.3 FT-IR analysis: The Fourier transform infrared spectroscopy (FT-IR) is a technique that is used to characterize the functional group of inorganic and organic compounds which are the key signatures of materials. In the present work, FT-IR spectra of homeopathic medicines prepared with α-lactose monohydrate as base material are used. FT-IR of the lactose and potencies medicine prepared from 1X to 6X were measured under a range of 450-4000 cm^{-1}. Figure 8 shows the FT-IR spectra of the homeopathic medicines and the lactose base. Several peaks related to lactose are detected in the FT-IR sector. The peak detected at 3528 cm^{-1} indicates the free –OH groups belonging to the terminal end of the structure of lactose. The absorption band that occurred at 2898 and 2933 cm^{-1} reveals the vibration of CH_2. An absorption peak at 1651 cm^{-1} is associated with the -OH stretching of adsorbed water. It is well known that lactose and other carbohydrates easily absorb water from the atmosphere as they contain numerous -OH groups, which are highly polar and hygroscopic. The band 1255 - 1021 cm^{-1} indicates the C=O frequencies [42]. The absorption band appeared between 1021 -745 cm^{-1} were assigned to CO and CC stretching of CH deformation followed by CH_2 vibration[43, 44].

Figure 8. FT-IR of the homeopathic medicine showed (a) the presence of all measure peaks related to lactose sample and an undetectable Ferrum (Iron Oxide), and (b) enlarged view of the FT-IR peaks

Moreover, the band 2900-3450 cm^{-1} was assigned to CH and OH vibrations groups. The band from 600 to 1500 cm^{-1} reveals the C-O and C-C groups of vibration of carbohydrates. The absorption band located at 900–750 cm^{-1} is characteristic of the saccharide configuration of lactose. It is worth pointing here that no additional peaks are observed in the case of homeopathic potencies made from Ferrum Metallica, slight changes in the peak intensity were only observed. To further confirm the presence of metal oxide in the samples, we have enlarged the FT-IR spectrum in the range of 750-500 cm^{-1}. It is well known that metal oxide peaks usually have signature peaks in the range of 750-500 cm^{-1}. The enlarged view of the curve represents the presence of all major peaks related to the lactose sample. The FT-IR result confirmed that the presence of Ferrum (iron oxide) in these samples is not detectable through these techniques. However, a significant change in different potencies is clearly visible in the Raman spectra.

4.0 Conclusions

In summary, the existence of a unique electromagnetic signature from homeopathic medicines via an indigenously developed experimental tool was observed under a low and upper range of low excitation frequency of 300 Hz and 4.8 kHz. Each potency of FM homeopathic medicine shows a significant and distinct electromagnetic signature at 4.8 kHz. Each potency of homeopathy samples exhibited a characteristic energy level and corresponding output voltages were obtained. A clear reduction in the output voltage/electromagnetic signal with increasing potency of FM medicine was observed at the low excitation frequency. Moreover, the electromagnetic signal was also recorded at the upper range of low frequency of 4.8 kHz and it was observed that output voltage increased from 65.62 μV to 149.49 μV for FM-1X potencies. A high resolution of 0.24 μV was obtained for FM-5X and FM-6X samples at 4.8 kHz as compared to 0.03 μV detected at 300 Hz. Various homeopathic medicines were also investigated and a distinct output voltage corresponding to each potency level was measured from the indigenously developed electromagnetic coil. Raman and FT-IR analysis of the homeopathic potencies were unable to clearly identify the potencies. However, the finding from our indigenously developed experimental setup confirmed that each of the homeopathic potency has its own electromagnetic signature under excitation frequency. This further provides scientific evidence and a unique way of classifying different homeopathic medicines and their corresponding potencies.

Declarations

Conflict of Interest

The author(s) declare no competing interests.

Author contributions

HNB and NN: Conceptualization, Writing - Review & Editing, Funding acquisition

MKG and MS: Formal analysis and investigation, writing original draft

AKS: Project Administration, Review & Editing, and Supervision

PB and MA: Methodology, Writing - Review & Editing

KSG and MRJ: Experimental

Data Availability Statement

The data that support the findings of this study are available from the corresponding author, HNB, upon reasonable request.

References

1. Hahnemann S. Samuel Hahnemann. Organon of Medicine

2. Viganò G, Nannei P, Bellavite P. Homeopathy: from tradition to science? *Journal of Medicine and the Person* **13**, 7-17 (2015).

3. Souter K. Heuristics and bias in homeopathy. *Homeopathy* **95**, 237-244 (2006).

4. Morrell P. The Greatness of Samuel Hahnemann. *American Journal of Homeopathic Medicine* **98**, (2005).

5. D'Huyvetter K, Cohrssen A. Homeopathy. *Primary Care: Clinics in Office Practice* **29**, 407-418 (2002).

6. Jütte R. The historiography of nonconventional medicine in Germany: a concise overview. *Medical history* **43**, 342-358 (1999).

7. Blessing B. *Pathways of Homoeopathic Medicine*. Springer Science & Business Media (2011).

8. Clark A. THE AGE of AlloPATHY AnD HoMEoPATHY. *The Art and Science of Healing Since Antiquity*, 237 (2011).

9. Kirschmann AT. *A vital force: women in American homeopathy*. Rutgers University Press (2004).

10. Coulter HL. *Divided legacy: the conflict between homoeopathy and the American Medical Association*. North Atlantic Books (1982).

11. Ernst E. *Homeopathy-The Undiluted Facts: Including a Comprehensive AZ Lexicon*. Springer (2016).

12. Nayernouri T. Homeopathy, ritual and magic. *Archives of Iranian medicine* **20**, 718 (2017).

13. Johnson F. What is Homœopathy? *British Homeopathic Journal* **64**, 184-187 (1975).

14. Haller J. The high dilutionists. In: *The History of American Homeopathy*). CRC Press (2005).

15. Parker LH. CXLII.—Reactions by trituration. *Journal of the Chemical Society, Transactions* **105**, 1504-1516 (1914).

16. Kalliantas D, Kassalia M, Georgiadou A, Karagianni CS. The physical features-size and granularity-of solid materials are strongly affected by trituration in lactose, before turning them into homeopathic solutions. *Materials Science and Engineering: C* **93**, 305-318 (2018).

17. Basu A, Temgire MK, Suresh AK, Bellare JR. Dilution-induced physico-chemical changes of metal oxide nanoparticles due to homeopathic preparation steps of trituration and succussion. *Homeopathy*

109, 065-078 (2020).

18. Darvell B. Efficiency of mechanical trituration of amalgam. III. Practical comparisons. *Australian dental journal* **26**, 236-243 (1981).

19. Lamrani K*, et al.* Production of fumagillin by Aspergillus fumigatus isolated from traditional trituration units, Maasra, in Morocco. *Micología Aplicada International* **20**, 35-41 (2008).

20. Morrell P. A Brief History of Potentization. *American Journal of Homeopathic Medicine* **100**, (2007).

21. Lyell D. An NMR study of the effect of succussion on parallel potencies of Natrum muriaticum.) (2004).

22. Lenger K, Bajpai R, Drexel M. Delayed luminescence of high homeopathic potencies on sugar globuli. *Homeopathy* **97**, 134-140 (2008).

23. Guedes JRP, Bonamin LV, Capelozzi VL. Water-related mechanisms proposed for storing and transmitting homeopathic information: putative links with biological responses. *Homeopathy* **107**, 172-180 (2018).

24. Endler P, Pongratz W, Smith C, Schulte J, Senekowitsch F, Citro M. Non-molecular information transfer from thyroxine to frogs. In: *Signals and images*). Springer (1997).

25. Messori C, Prinzera SV, di Bardone FB. The super-coherent state of biological water. *Open Access Library Journal* **6**, 1 (2019).

26. Walach H. Magic of signs: a non-local interpretation of homeopathy. *British Homeopathic Journal* **89**, 127-140 (2000).

27. Gounelas R. Samuel Butler, Homoeopathy, and the Unity of Opposing Principles. *Journal of the Australasian Universities Language and Literature Association* **53**, 25-41 (1980).

28. Bell IR, Koithan M. A model for homeopathic remedy effects: low dose nanoparticles, allostatic cross-adaptation, and time-dependent sensitization in a complex adaptive system. *BMC complementary and alternative medicine* **12**, 1-21 (2012).

29. Mahata CR. Quantum electro-dynamics helps homoeopathy achieve its scientific basis (paving the way for a generalized concept of medicine). *International Journal of High Dilution Research-ISSN 1982-6206* **16**, (2017).

30. Maity T, Chakraborty A, Mahata C. Dissipative structures in water, validated by quantum electrodynamics, are information carriers of solute through dilutions. *Int J Complement Alt Med* **12**, 221-223 (2019).

31. Maity T, Mahata C. Succussed Serial Dilutions in Water Carry Solute Information via Solute-Specific Water Structures–A Theory Based on Quantum Electrodynamics. *Homeopathy*, (2021).

32. Walach H. Entanglement model of homeopathy as an example of generalized entanglement predicted by weak quantum theory. *Complementary Medicine Research* **10**, 192-200 (2003).

33. Montagnier L., Giudice E D, A¨ıssa Jamal, Lavallee Claude, Motschwiller Steven, Capolupo Antonio, Polcari Albino, Romanog Paola, Tedeschi Alberto, and Vitielloe Giuseppe, Transduction of DNA information through water and electromagnetic waves, Electromagnetic Biology and Medicine, 34(2), 106–112 (2015)

34. Montagnier L., Aissa J, Giudice E D, Lavallee C, Tedeschi A and Vitiello G, DNA waves and water, Journal of Physics: Conference Series 306 (2011) 012007

35. Montagnier L., A¨ISSA Jamal, FERRIS St´ephane, MONTAGNIER Jean-Luc, LAVALLEE´ Claude, Electromagnetic Signals Are Produced by Aqueous Nanostructures Derived from Bacterial DNA Sequences, Interdiscip Sci Comput Life Sci, 1, 81–90 (2009).

36. Kalliantas D., Kassalia M.E., Georgiadou A., Karagianni Ch.S., "The physical features -size and granularity- of solid materials are strongly affected by trituration in lactose, before turning them into homeopathic solutions," Materials Science and Engineering: C, 93, 305-318, (2018)

37. Hunt RW, Zavalin A, Bhatnagar A, Chinnasamy S, Das KC. Correction: Hunt, R.W. et al. Electromagnetic Biostimulation of Living Cultures for Biotechnology, Biofuel and Bioenergy Applications. Int. J. Mol. Sci. 10, 4515–4558 (2009).

38. Kelha V., Pukki J., Peltonen R., Penttinen A., Ilmoniemi R.and Heino J., "Design, construction, and performance of a large-volume magnetic shield," in *IEEE Transactions on Magnetics*, 18, 260-270, (1982)

39. Zhao, Y.; Sun, Z.; Pan, D.; Lin, S.; Jin, Y.; Li, L. A New Approach to Calculate the Shielding Factor of Magnetic Shields Comprising Nonlinear Ferromagnetic Materials under Arbitrary Disturbances. *Energies* 2019, *12*, 2048. https://doi.org/10.3390/en12112048

40. Lenger K., Homeopathic potencies identified by a new magnetic resonance method: Homeopathy—An Energetic Medicine, Subtle Energies & Energy Medicine, 15, 225-43 (2006).

41. Lide, D. R., ed. (2005). "Magnetic susceptibility of the elements and inorganic compounds". CRC Handbook of Chemistry and Physics (86th ed.). Boca Raton (FL): CRC Press.

42. Pană A-M, Rusnac L-M, Bandur G, Silion M, Deleanu C, Bălan M. Novel D-glucose and D-mannose based oligomers: Synthesis and characterization. *e-Polymers* **11**, (2011).

43. Ibrahim M, Alaam M, El-Haes H, Jalbout AF, Leon Ad. Analysis of the structure and vibrational spectra of glucose and fructose. *Ecletica quimica* **31**, 15-21 (2006).

44. Do BPH, Nguyen BD, Nguyen HD, Nguyen PT. Synthesis of magnetic composite nanoparticles enveloped in copolymers specified for scale inhibition application. *Advances in Natural Sciences: Nanoscience and Nanotechnology* **4**, 045016 (2013).

Figures

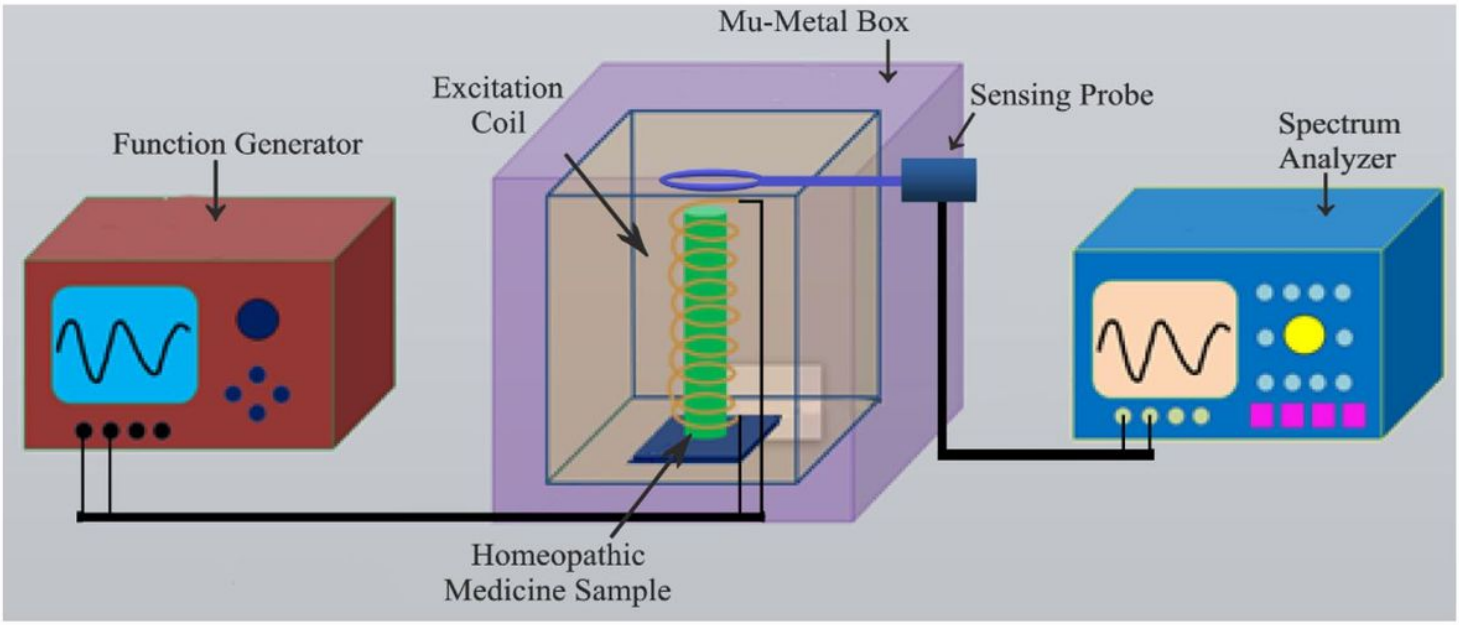
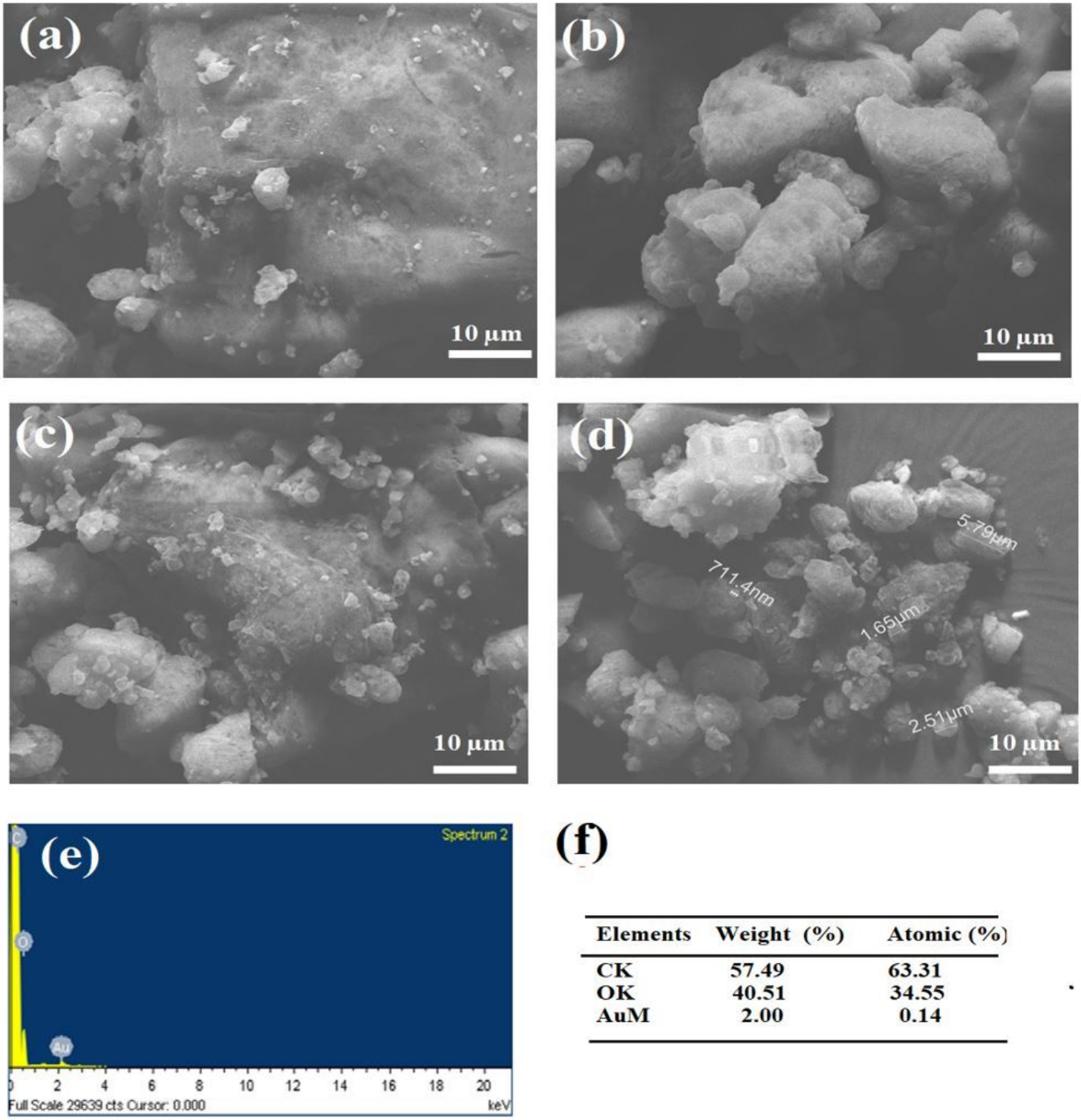


Figure 1

Experimental setup for the characterization of the homeopathic potencies consisting of function generator, excitation coil and sensing probe, Mu-metal shielding box, spectrum analyser and computer-based data acquisition systems



Elements	Weight (%)	Atomic (%)
CK	57.49	63.31
OK	40.51	34.55
AuM	2.00	0.14

Figure 2

SEM image of the (a) lactose (sugar of milk) and (b) Ferrum Metallicum-1X homeopathic sample, (c) Ferrum Metallicum-6X homeopathic sample, (d) Ferrum Metallicum-1X homeopathic sample labeled with particle size, (e) EDS analysis of sample and (f) Elemental analysis of Ferrum Metallicum-1X sample.

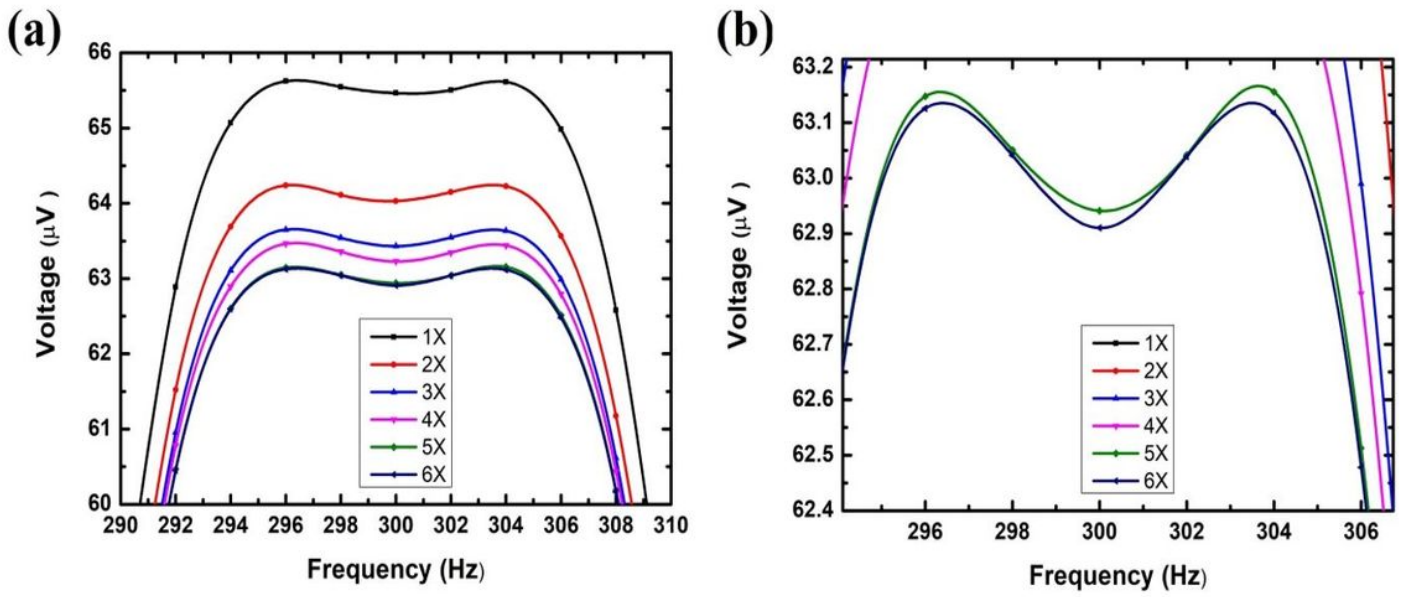


Figure 3

(a) Electromagnetic signals/output voltage from various Ferrum Metallicum samples under excitation frequency of 300 Hz and (b) an enlarged view of the Electromagnetic signals/output voltage displaying a small noticeable difference between 5X and 6X potencies.

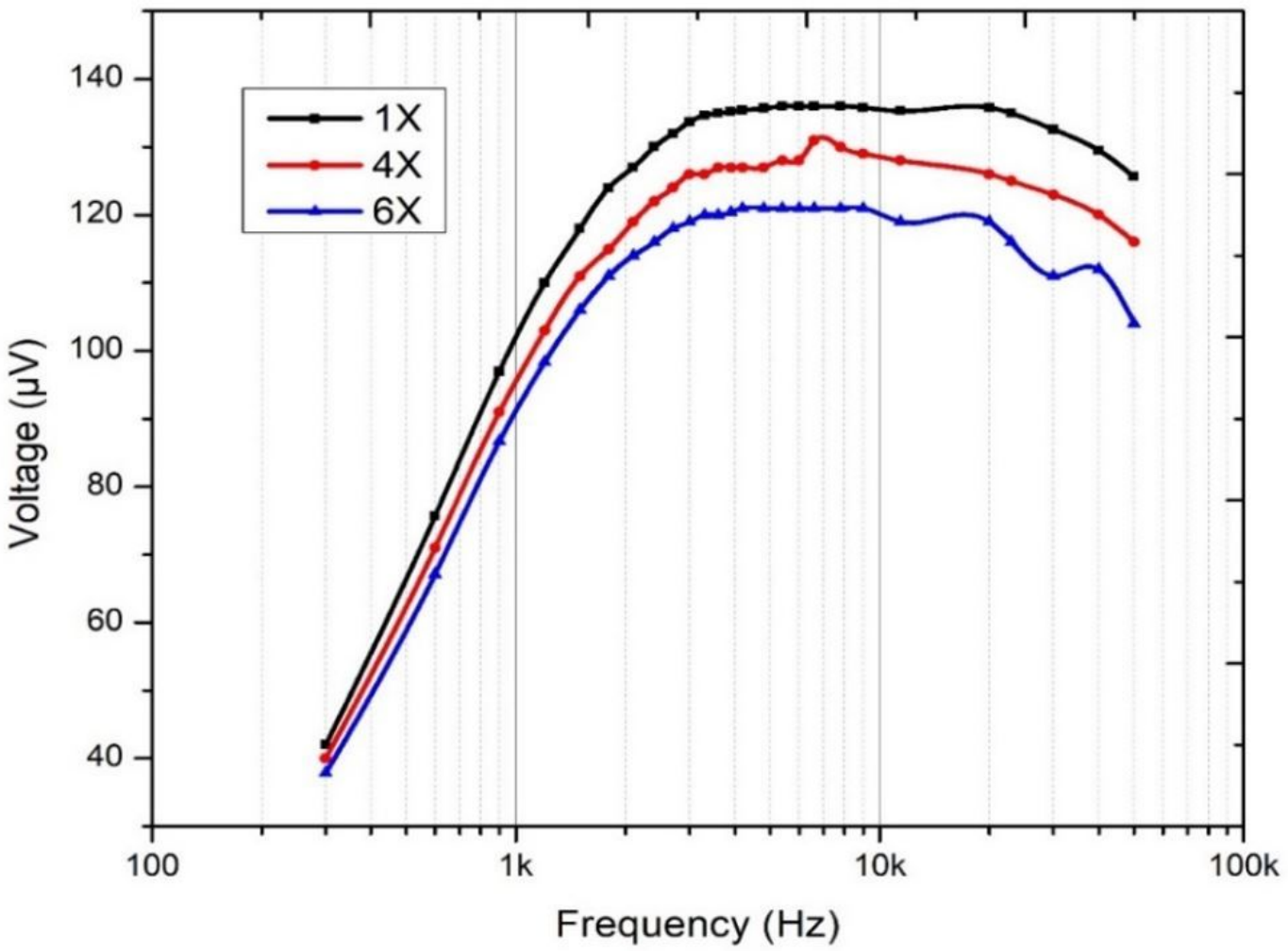


Figure 4

Electromagnetic signals/output voltage from Ferrum Metallicum sample of different potencies at various frequency ranging from 300 Hz to 60000 Hz.

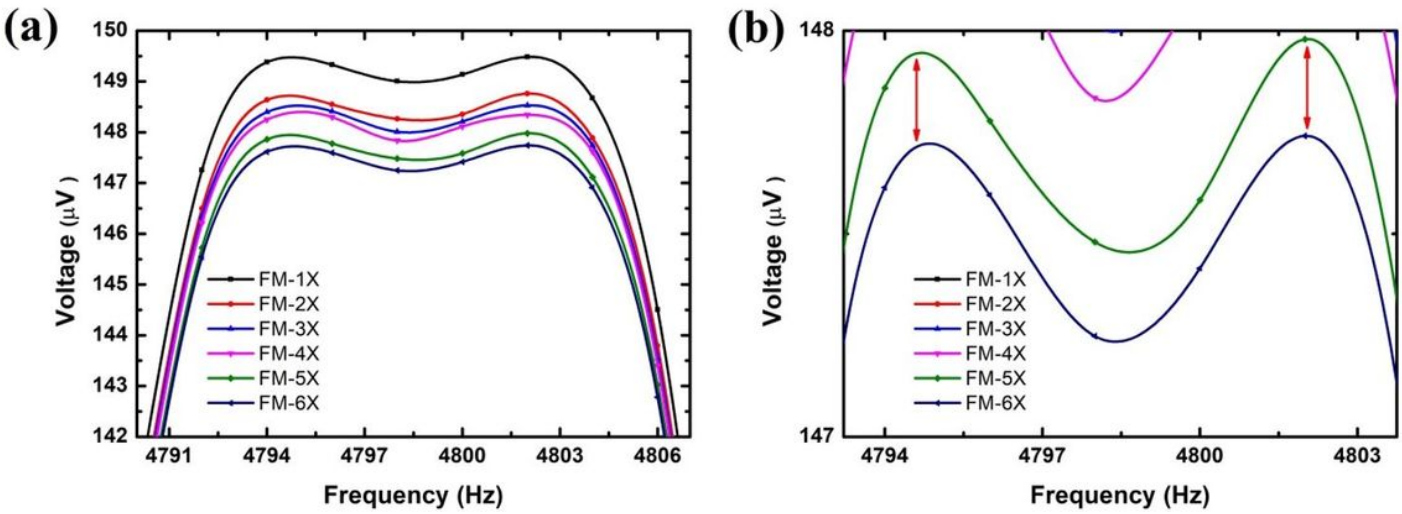


Figure 5

(a) Electromagnetic signals/output voltage from Ferrum Metallicum sample under excitation frequency of 4.8 kHz and (b) an enlarged view of the Electromagnetic signals/output voltage displaying a larger noticeable difference between 5X and 6X

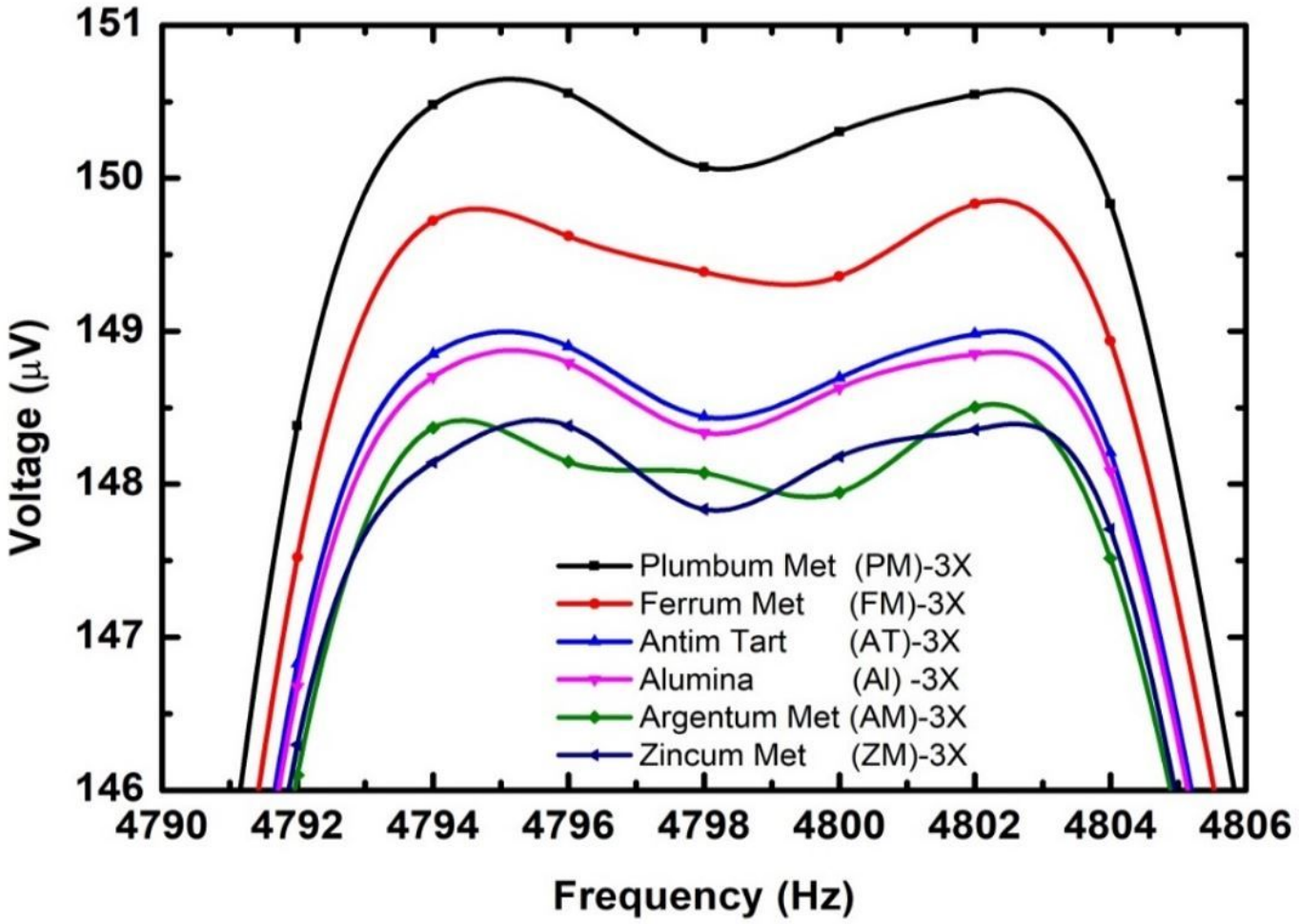


Figure 6

Electromagnetic signals/output voltage from various homeopathy sample under excitation frequency of 4.8 kHz.

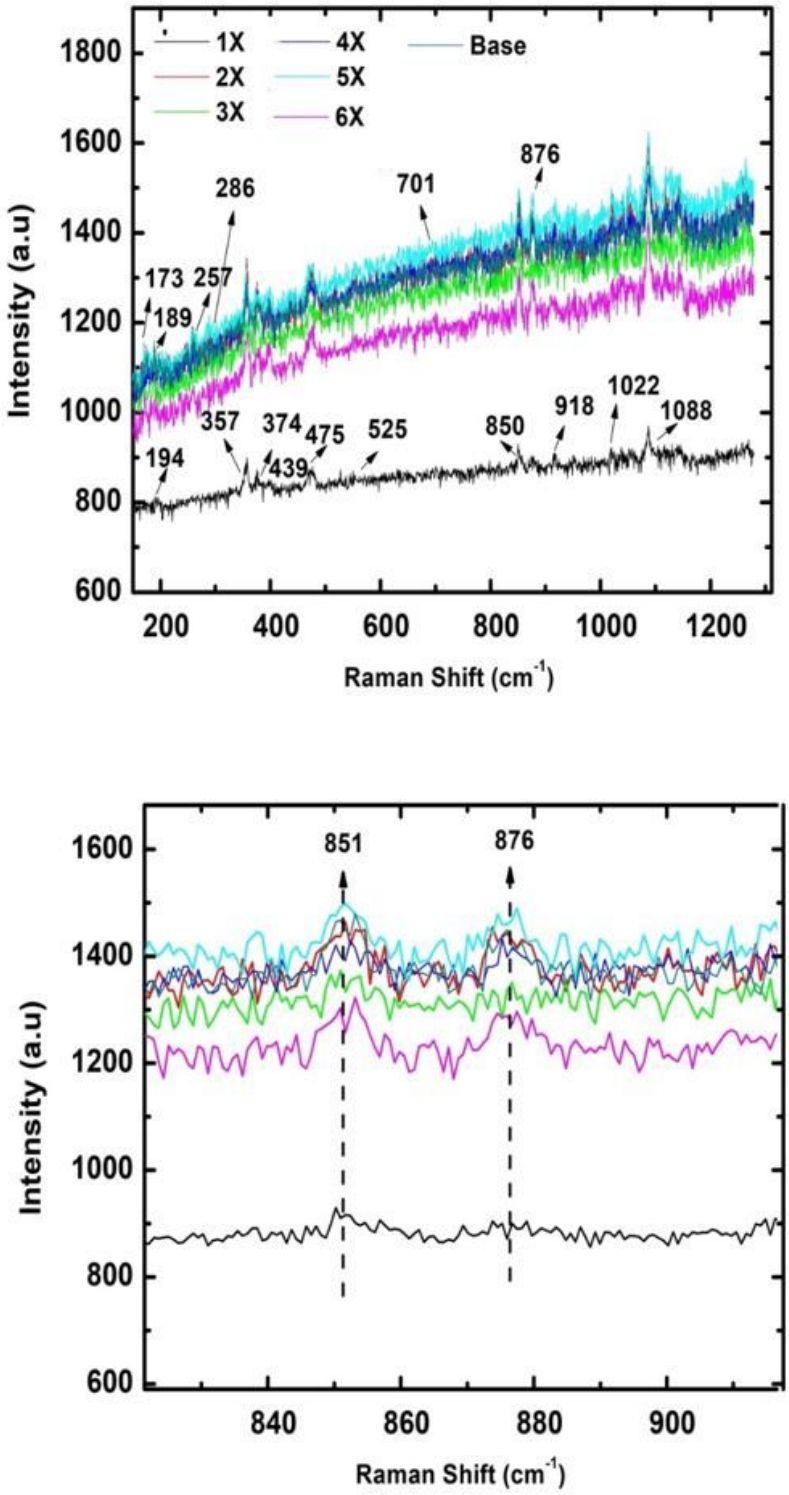


Figure 7

Raman spectroscopy analysis of (a) lactose based and Ferrum Met homeopathic medicines of 1X-6X potency, and (b) enlarged view of the Raman peaks

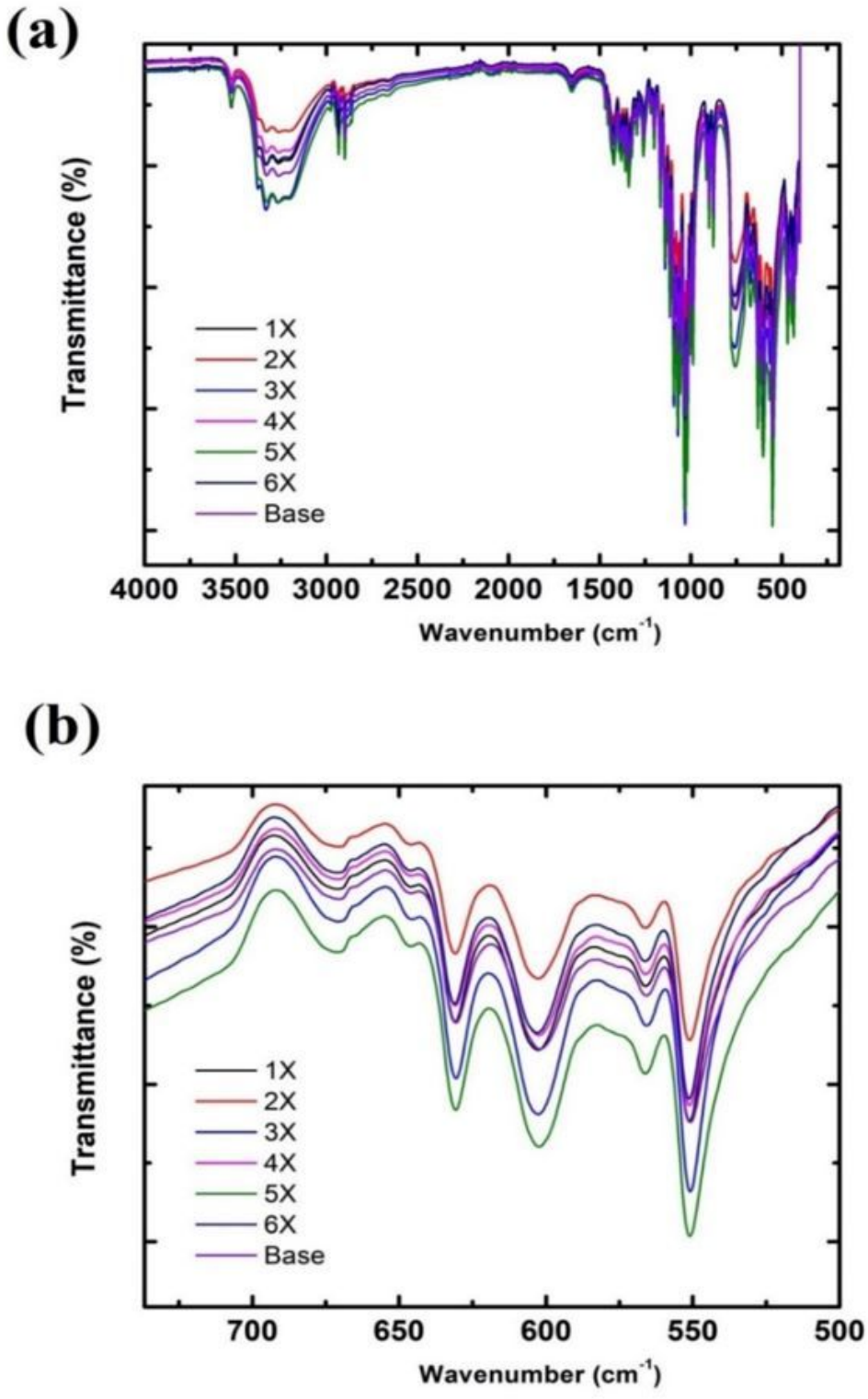


Figure 8

FT-IR of the homeopathic medicine showed (a) the presence of all measure peaks related to lactose sample and an undetectable Ferrum (Iron Oxide), and (b) enlarged view of the FT-IR peaks