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Evaluation of Consciousness Energy Healing Treated Pyridoxine (Vitamin B_6)

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Keywords: pyridoxine, the trivedi effect®, consciousness energy healing treatment, particle size, surface area, PXRD, DSC, TGA/DTG.

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Abstract- **The aim of the research work to evaluate the impact of the Consciousness Energy Treatment on the physicochemical and thermal properties of pyridoxine using the modern analytical technique. The sample was divided into control and treated part. Only the treated sample was received the Trivedi Effect®-Consciousness Energy Treatment remotely by a renowned Biofield Energy Healer, Dahryn Trivedi. The particle sizes were significantly decreased by 17%(d_{10}), 6.2%(d_{50}), 0.54%(d_{90}), and 0.3% {D(4,3)}; thus, the specific surface area was significantly increased by 13.72% in the treated pyridoxine compared with the control sample. The PXRD peak intensities and crystallite sizes were significantly altered ranging from -40.45% to 154.76% and -57% to 51.33%, respectively; however, the average crystallite size was decreased by 6.52% in the treated sample compared with the control sample. The heat requires to melt (fusion) the treated pyridoxine was increased by 3.82% compared with the control sample. The total weight loss was significantly decreased by 5.14%; however, the residue amount was significantly increased by 8.34% in the treated sample compared with the control sample. The Trivedi Effect® might have generated a new polymorphic form of pyridoxine which may offer better solubility, bioavailability, and therapeutic efficacy against many diseases compared to the control sample.**

Keywords: pyridoxine, the trivedi effect®, consciousness energy healing treatment, particle size, surface area, PXRD, DSC, TGA/DTG.

I. Introduction

Pyridoxine is a water-soluble vitamin also known as vitamin B_6. The active form of vitamin B_6 is pyridoxal 5′-phosphate, which functions as a coenzyme in many enzyme reactions in the proteins, lipids, carbohydrates metabolism, synthesis of neurotransmitters, and steroid hormones function[1]. Along with this, it also plays a significant role in the normal function of the nervous system, endocrine system, immune system, red blood cell, and also maintain the blood glucose level in the body[1-3]. Pyridoxine can be inter-converted into pyridoxal (aldehyde) and pyridoxamine (amine) form. Pyridoxine, pyridoxamine, and their phosphorylated forms are the major forms of vitamin B_6 in plant food, while pyridoxal and pyridoxal-5'-phosphate are obtained from animal food. The hydrochloride salt of vitamin B_6 is pyridoxine HCl[4]. Vitamin B_6 is commonly used as vitamin supplement or as a component of multivitamin preparations to prevent and treat the vitamin B_6 deficiency, sideroblastic anaemia, pyridoxine dependency seizures, metabolic disorders, Alzheimer's disease, pulmonary tuberculosis, cardiovascular disease, hyperhomocysteinemia, anxiety, asthma, attention deficit hyperactivity disorder, cancer, depression, dysmenorrhoea, diabetes, post-partum lactation suppression, McArdle's disease, osteoporosis, etc.[2,5-8]. Vitamin B_6 is light sensitive and degrades slowly when exposed to light. It is soluble in water and alcohol; sparingly soluble in acetone; insoluble in ether and chloroform. When it heated to decomposition, it emits very toxic fumes of oxides of nitrogen and hydrogen chloride[9].

Physicochemical properties of the pharmaceutical or nutraceutical compounds play a verycrucial role in its dissolution, absorption, bioavailability, and therapeutic profile in the body[10]. In this regards, the Trivedi Effect®-Consciousness Energy Healing Treatment has a significant impact altering the physicochemical properties such as crystal structure, particle size, surface area, thermal behaviour, and bioavailability profile of pharmaceutical and nutraceutical compounds[11-14]. The Trivedi Effect® is a natural and only scientifically proven phenomenon in which an expert can harness this inherently intelligent energy from the Universe and transmit it anywhere on the planet through the possible mediation of neutrinos[15]. The Biofield is a unique, infinite, and para-dimensional electromagnetic energy field exists surrounding the body of every living organism, which is generated from the continuous moment of charged particles (i.e., ions, cells, blood flow, etc.) inside the body. The Biofield based Energy Healing Therapies have significant beneficial outcomes against various disease conditions[16]. The National Institutes of Health/National Center for Complementary and Alternative Medicine (NIH/NCCAM) recommend and included the Energy therapy under Complementary and Alternative Medicine (CAM) category along with other therapies, i.e., homeopathy, naturopathy, Ayurvedic medicine, acupuncture, acupressure, Qi Gong, Tai Chi, Reiki, healing touch, Rolfing, hypnotherapy, etc., which have been accepted by most of the USA people[17,18].The Trivedi Effect®-Consciousness Energy Healing Treatment also has the significant impact on the properties of metals, ceramics, and polymers, organic compounds, microorganisms, cancer cell, and improve

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the overall productivity of crops[19-28]. All these outstanding results inspired the authors to evaluate the impact of the Trivedi Effect®-Consciousness Energy Healing Treatment on the behavioural, physicochemical, and thermal properties of pyridoxine HCl using powder particle size analysis (PSA), X-ray diffraction (PXRD), differential scanning calorimetry (DSC), and thermogravimetric analysis (TGA)/differential thermogravimetric analysis (DTG).

II. Materials and Methods

a) Chemicals and Reagents

Pyridoxine HCl was purchased from Tokyo Chemical Industry Co. Ltd., Japan. All other chemicals utilized in the experiments were of analytical grade available in India.

b) Consciousness Energy Healing Treatment Strategies

The pyridoxine powder sample was divided into two equal parts. One part of pyridoxine was treated with the Trivedi Effect®-Consciousness Energy Healing Treatment remotely under standard laboratory conditions for 3 minutes by the renowned Biofield Energy Healer, Dahryn Trivedi, USA, and known as a treated sample. However, the second part of the test sample did not receive the Biofield Energy Treatment and termed as a control sample. The control sample later received the treatment from a "sham" healer, whereas the "sham" healer was ignorant about the Biofield Energy Treatment. After the treatment, the Biofield Energy Treated and untreated samples were kept in sealed conditions and characterized using PSA, PXRD, DSC, and TGA analytical techniques.

c) Characterization

The PSA, PXRD, DSC, and TGA analysis of pyridoxine were performed. The PSA was performed using Malvern Master sizer 2000, from the UK with a detection range between 0.01 μm to 3000 μm using the wet method[28,29]. The PXRD analysis of pyridoxine powder sample was performed with the help of Rigaku MiniFlex-II Desktop X-ray diffractometer (Japan)[31,32]. The average size of crystallites was calculated from PXRD data using the Scherrer's formula (1):

$$G = k\lambda/\beta\cos\theta \quad (1)$$

Where G is the crystallite size in nm, k is the equipment constant (0.94), λ is the radiation wavelength (0.154056 nm for Kα1 emission), β is the full-width at half maximum, and θ is the Bragg angle[33].

Similarly, the DSC analysis of pyridoxine was performed with the help of DSC Q200, TA instruments[28,29]. The TGA/DTG thermograms of pyridoxine were obtained with the help of TGA Q50TA instruments[28,29].

The % change in particle size, specific surface area (SSA), peak intensity, crystallite size, melting point, latent heat, weight loss and the maximum thermal degradation temperature (T_{max}) of the Biofield Energy Treated sample was calculated compared with the control sample using the following equation 2:

$$\%\ \text{change} = \frac{[\text{Treated} - \text{Control}]}{\text{Control}} \times 100 \quad (2)$$

III. Results and Discussion

a) Particle Size Analysis (PSA)

The particle size analysis of both the control and the Biofield Energy Treated pyridoxine powder samples were performed, and the data are presented in Table 1. The particle sizes in the Biofield Energy Treated sample were significantly decreased at d_{10}, d_{50}, d_{90}, and D(4,3) by 17%, 6.2%, 0.54%, and 0.3% respectively compared to the control sample. However, the particle size value in the Biofield Energy Treated pyridoxine was significantly increased at by compared to the control sample. The SSA of the Biofield Energy Treated pyridoxine (0.456 m^2/g) was significantly increased by 13.72% compared to the control sample (0.401 m^2/g). From the results, it can be assumed that the Biofield Energy Healing Treatment acting as an external force for breaking the larger particles to smaller one in size, hence increased the surface area. The particle size, shape, and surface area have their impact on the solubility, dissolution rate, absorption, bioavailability, and therapeutic efficacy of a drug[34,35]. Thus, the Biofield Energy Treated pyridoxine would assume to enhance the therapeutic efficacy of the nutraceutical and pharmaceutical formulations.

Table 1: Particle Size Distribution of the Control and Biofield Energy Treated Pyridoxine

Parameter	d_{10} (μm)	d_{50} (μm)	d_{90} (μm)	D(4,3) (μm)	SSA (m^2/g)
Control	8.22	40.38	138.77	60.44	0.401
Biofield Treated	6.82	37.88	138.02	60.26	0.456
Percent Change* (%)	-17.00	-6.20	-0.54	-0.30	13.72

*d_{10}, d_{50}, and d_{90}: particle diameter corresponding to 10%, 50%, and 90% of the cumulative distribution, D(4,3): the average mass-volume diameter, and SSA: the specific surface area. *denotes the percentage change in the Particle size distribution of the treated sample with respect to the control sample.*

b) Powder X-ray Diffraction (PXRD) Analysis

The PXRD diffractograms of the control and treated pyridoxine showed sharp and intense (Figure 1) indicated that both the samples were crystalline. The control and Biofield Energy Treated pyridoxine powder samples showed the highest peak intensity at 2θ equal

to 25° (Table 2, entry 7). The peak intensities of the Biofield Energy Treated pyridoxine sample were significantly altered ranging from -40.45% to 154.76% compared to the control sample.

Table 2: PXRD Data for the Control and the Treated Pyridoxine

Entry No.	Bragg Angle (°2θ)		Peak Intensity (%)			Crystallite Size (G, nm)		
	Control	Treated	Control	Treated	% Change [a]	Control	Treated	% Change [b]
1	10.28	10.33	157.00	129.00	-17.83	344.00	307.00	-10.76
2	15.49	15.56	22.00	20.00	-9.09	362.00	443.00	22.38
3	16.86	16.93	65.00	57.00	-12.31	353.00	301.00	-14.73
4	18.61	18.65	39.00	30.00	-23.08	393.00	444.00	12.98
5	20.72	20.75	962.00	899.00	-6.55	413.00	440.00	6.54
6	24.10	24.09	63.00	94.00	49.21	386.00	498.00	29.02
7	25.00	25.04	1301.00	1292.00	-0.69	429.00	437.00	1.86
8	25.77	25.78	117.00	110.00	-5.98	306.00	317.00	3.59
9	27.77	27.81	1025.00	1075.00	4.88	431.00	422.00	-2.09
10	28.86	28.91	125.00	121.00	-3.20	149.00	143.00	-4.03
11	31.34	31.44	25.00	16.00	-36.00	529.00	277.00	-47.64
12	33.63	33.71	42.00	107.00	154.76	380.00	223.00	-41.32
13	37.09	37.20	89.00	53.00	-40.45	261.00	338.00	29.50
14	37.63	37.74	28.00	51.00	82.14	393.00	169.00	-57.00
15	38.55	38.49	42.00	39.00	-7.14	134.00	78.00	-41.79
16	47.32	47.36	41.00	44.00	7.32	150.00	227.00	51.33
17	53.26	53.30	137.00	160.00	16.79	259.00	238.00	-8.11
18	Average Crystallite Size					333.65	311.88	-6.52

[a] denotes the percentage change in the peak intensity of the Biofield Energy Treated sample with respect to the control sample; [b] denotes the percentage change in the crystallite size of the Biofield Energy Treated sample with respect to the control sample.

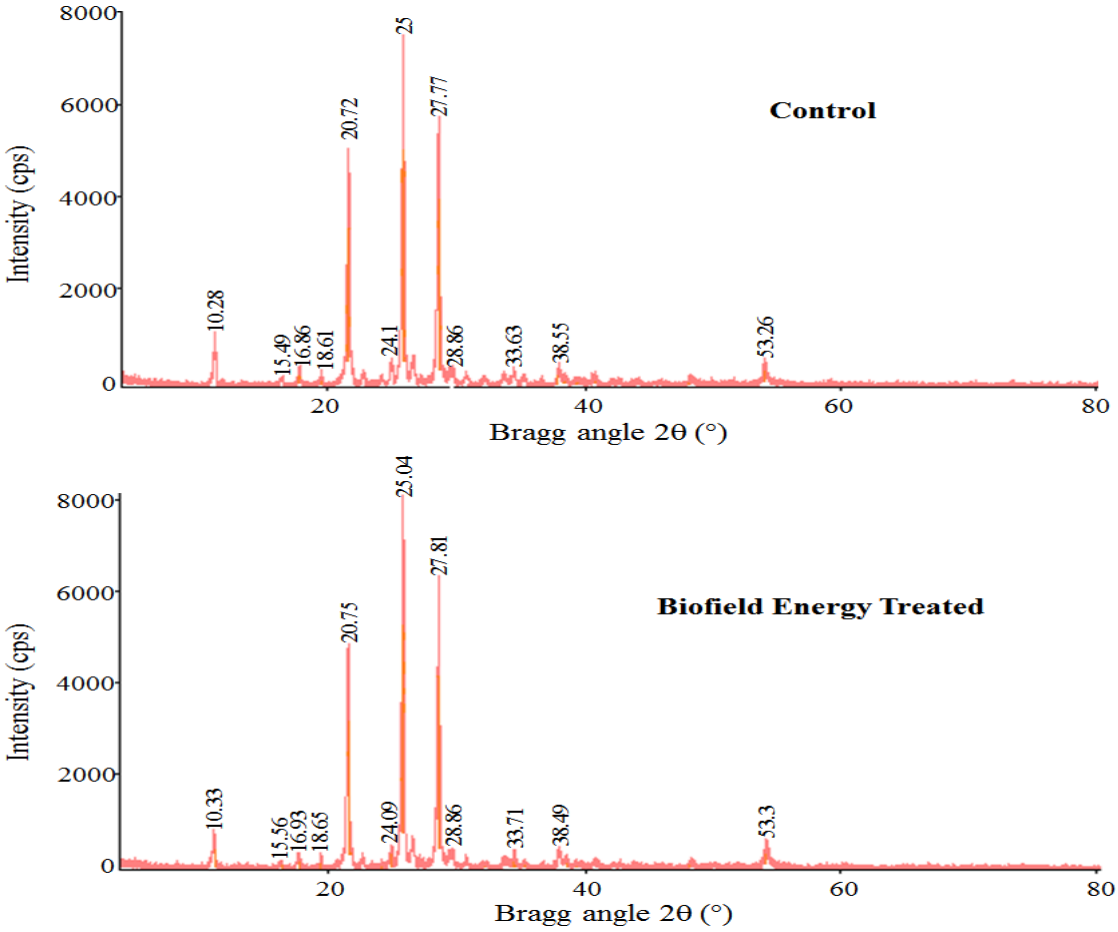


Fig. 1: PXRD Diffractograms of the Control and Biofield Energy Treated Pyridoxine

Similarly, the crystallite sizes of the Biofield Energy Treated pyridoxine powder sample were significantly altered ranging from -57% to 51.33% compared to the control sample. Overall, the average crystallite size of the Biofield Energy Treated pyridoxine powder sample (311.88 nm) was significantly decreased by 6.52% compared with the control sample (333.65 nm).

The peak intensities and crystallite sizes of the Biofield Energy Treated pyridoxine powder samples were significantly altered compared to the control sample. The peak intensity of each diffraction face of a compound changes according to the change in the crystal morphology[36] and alterations in the PXRD pattern provide the proof of polymorphic transitions[37,38]. The Biofield Energy Healing Treatment probably produced the new polymorphic form of pyridoxine through the Biofield Energy *via* neutrino oscillations[14]. Different polymorphic forms of the pharmaceuticals have significant effects on the drug performance, because of their different thermodynamic and physicochemical properties from the original one[39,40]. Therefore, it is assumed that the Trivedi Effect®-Consciousness Energy Healing Treated pyridoxine would be better in designing novel pharmaceutical formulations for more drug performance.

c) Differential Scanning Calorimetry (DSC) Analysis

The DSC thermograms of both the control and Biofield Energy Treated pyridoxine samples showed a very sharp endothermic peak at 215.42°C and 215.2°C, respectively (Figure 2).The experimental results closely matched to the reported data[41]. The melting point of the Biofield Energy Treated pyridoxine did not alter much compared to the control sample (Table 3).

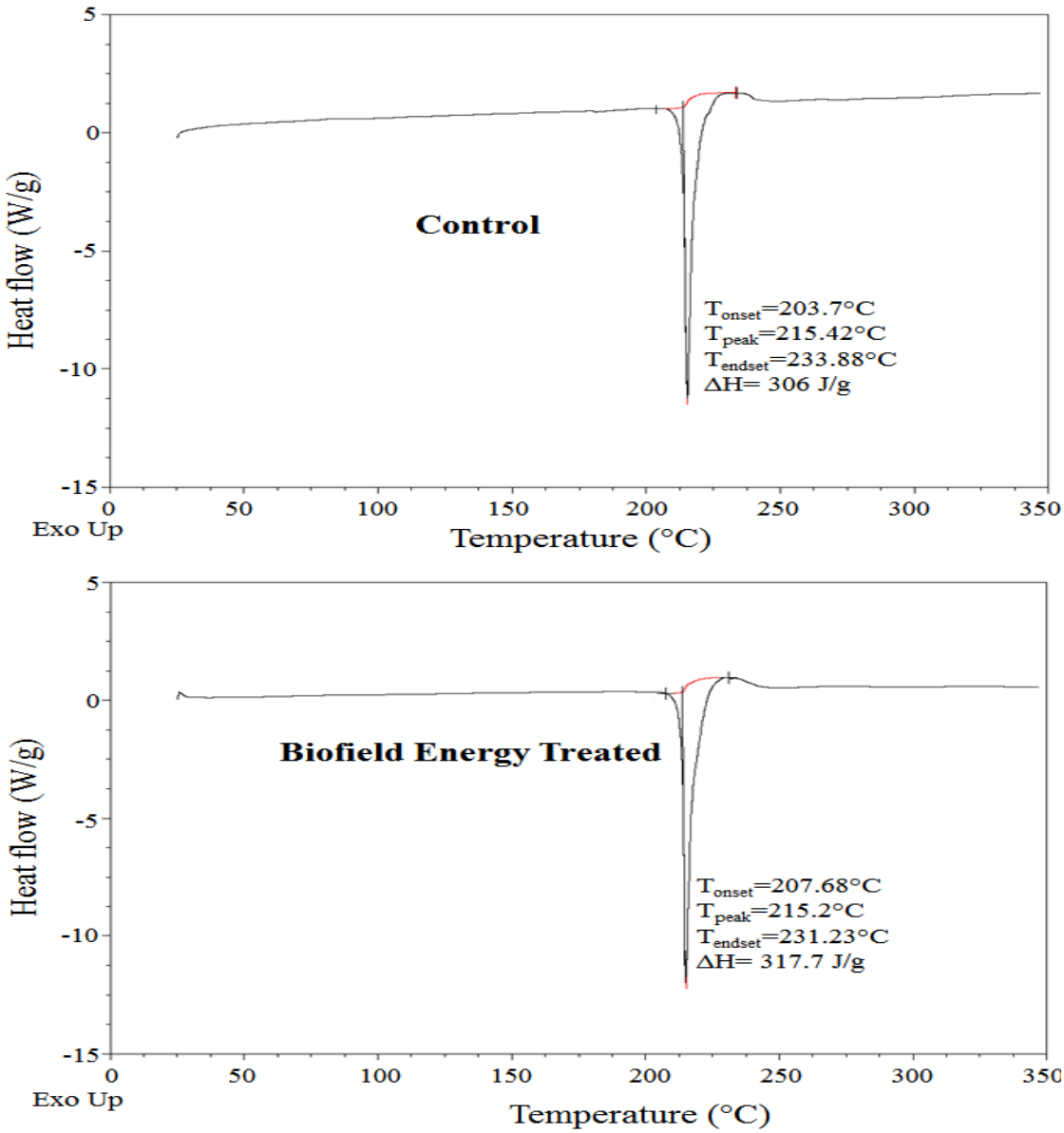


Fig. 2: DSC Thermograms of the Control and Biofield Energy Treated Pyridoxine

Table 3: DSC Data for Both Control and Biofield Energy Treated Samples of Pyridoxine

Sample	Melting Temp (°C)	ΔH_{Fusion} (J/g)
Control Sample	215.42	306.00
Biofield Energy Treated	215.20	317.70
% Change*	-0.10	3.82

*ΔH: Latent heat of fusion, *denotes the percentage change of the Biofield Energy Treated pyridoxine with respect to the control sample.*

The latent heat of fusion (ΔH_{fusion}) of the Biofield Energy Treated sample (317.7 J/g) was increased by 3.82% compared with the control sample (306 J/g) (Table 3). Any change in the latent heat of fusion can be attributed to the disrupted molecular chains and the crystal structure of that compound[42]. Therefore, the Trivedi Effect® - Consciousness Energy Healing Treatment assumed to have a significant impact on the molecular chains and crystal structure of the treated pyridoxine responsible for the elevation of thermal stability compared to the control sample.

d) Thermal Gravimetric Analysis (TGA)/ Differential Thermogravimetric Analysis (DTG)

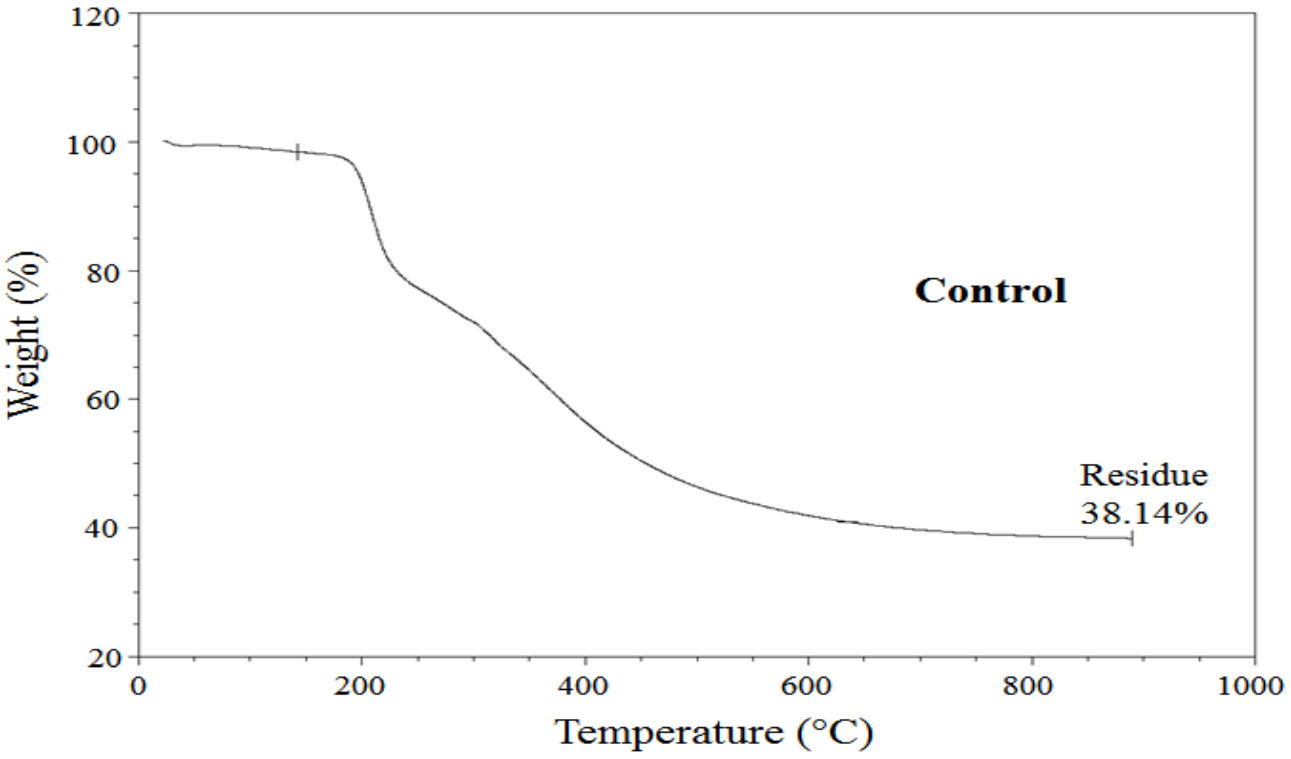
The TGA thermograms of both the control and Biofield Energy Treated pyridoxine samples showed two steps of thermal degradation (Figure 3). The total weight loss of the Biofield Energy Treated sample was significantly decreased by 5.14% compared to the control sample. Thus, the residue amount was significantly increased by 8.34% in the Biofield Energy Treated pyridoxine compared to the control sample (Table 4).

Table 4: TGA/DTG Data of the Control and Biofield Energy Treated Samples of Pyridoxine

Sample	TGA		DTG; T_{max} (°C)	
	Total Weight Loss (%)	Residue %	1st Peak	2nd Peak
Control	61.86	38.14	208.75	381.08
Biofield Energy Treated	58.68	41.32	214.94	373.16
% Change*	-5.14	8.34	2.97	-2.08

** denotes the percentage change of the Biofield Energy Treated sample with respect to the control sample, T_{max} = the temperature at which maximum weight loss takes place in TG or peak temperature in DTG.*

The DTG thermograms of the control and Biofield Energy Treated pyridoxine also reported two peaks in the thermograms (Figure 4). The T_{max} of the 1st peak of the Biofield Energy Treated sample was increased by 2.97%, whereas T_{max} of 2nd peak was decreased by 2.08% compared to the control sample (Table 4). Overall, TGA/DTG analysis revealed that the thermal stability of the Biofield Energy Treated sample was significantly increased compared with the control sample.



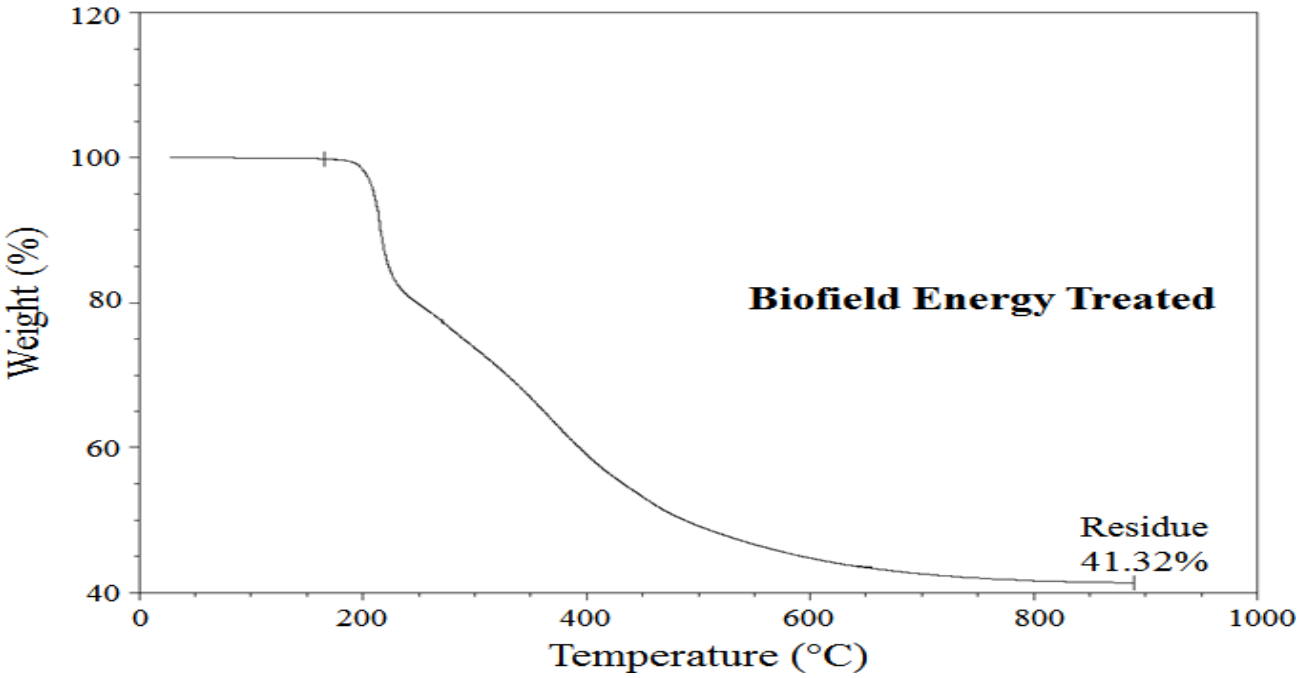


Fig. 3: TGA Thermograms of the Control and Biofield Energy Treated Pyridoxine

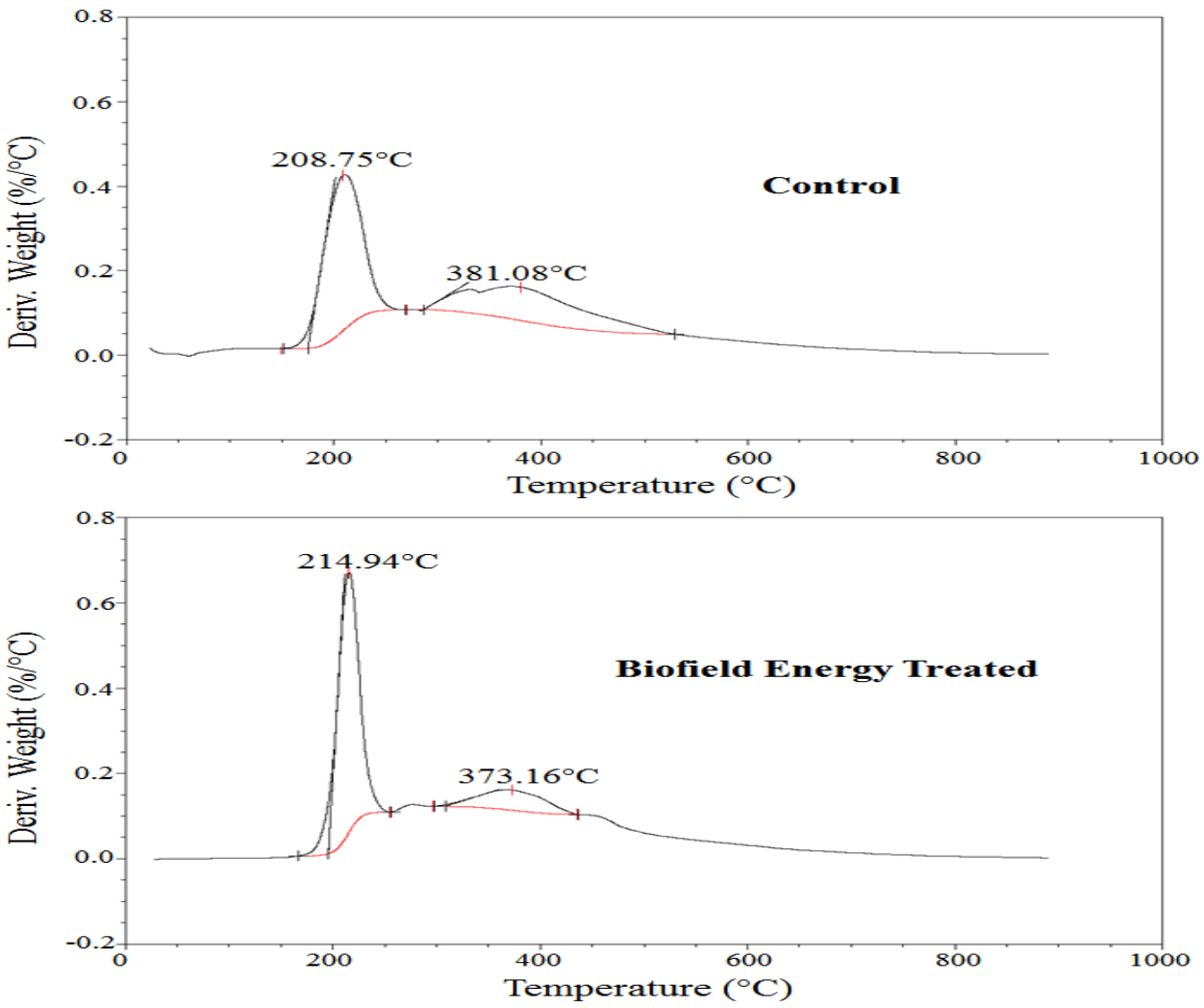


Fig. 4: DTG Thermograms of the Control and Biofield Energy Treated Pyridoxine

IV. Conclusions

The Trivedi Effect®-Consciousness Energy Healing Treatment has shown a significant effect on the crystallite size, particle size, SSA, and thermal behavior of pyridoxine. The particle sizes in the Biofield Energy Treated powder sample was significantly decreased by 17%, 6.2%, 0.54%, and 0.3% at d_{10}, d_{50}, d_{90}, and D(4,3) respectively, compared to the control sample. Therefore, the SSA of the Biofield Energy Treated sample was significantly increased by 13.72% compared to the control sample. The PXRD peak intensities and crystallite sizes of the treated pyridoxine were significantly altered ranging from -40.45% to 154.76% and -57% to 51.33%, respectively compared to the control sample. The average crystallite size of the Biofield Energy Treated pyridoxine was significantly decreased by 6.52% compared with the control sample. The ΔH_{fusion} was increased by 3.82% in the Biofield Energy Treated sample compared with the control sample. The total weight loss was significantly decreased by 5.14%; hence the residue amount was significantly increased by 8.34% in the Biofield Energy Treated sample compared with the control sample. From the results, it is concluded that the Trivedi Effect®-Consciousness Energy Healing Treatment might have generated a new polymorphic form of pyridoxine which may offer better solubility, bioavailability, and therapeutic efficacy compared with the control sample. The Trivedi Effect®-Consciousness Energy Healing Treated pyridoxine hydrochloride would be very useful to design novel pharmaceutical and nutraceutical formulations that may offer better therapeutic response against vitamin B_6 deficiency, pyridoxine-dependency seizures, sideroblastic anemia, Alzheimer's disease, metabolic disorders, diabetes, pulmonary tuberculosis, cardiovascular disease, hyperhomocysteinemia, cancer, anxiety, asthma, depression, attention deficit hyperactivity disorder (ADHD), dysmenorrhoea, post-partum lactation suppression, McArdle's disease, osteoporosis, etc.

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Abbreviations

DSC: Differential scanning calorimetry,
FWHM: Full width half maximum.
G: Crystallite size.
T_{onset}: Onset decomposition temperature.
T_{peak}: Peak decomposition temperature.
T_{endset}: Endset decomposition temperature.
ΔH: Enthalpy of fusion/decomposition.
PSA: Particle size distribution analysis.
PXRD: Powder X-ray diffraction.
TGA: Thermal gravimetric analysis.
SSA: Specific surface area.
DTG: Differential thermogravimetric analysis.
NIH: National institutes of health.
NCCAM: National center for complementary and alternative medicine.
CAM: Complementary and alternative medicine.

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