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Medical Full Length Article

Effect of the Consciousness Energy Healing Treatment: Characterization of the Physicochemical and Thermal Properties of Vitamin B_6

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Pyridoxine (vitamin B_6) is widely used as a dietary supplement for the prevention and treatment of vitamin B_6 deficiency, anemia, cardiovascular disease, tuberculosis, etc. The objective of this research study was to evaluate the impact of the Trivedi Effect® on the physicochemical properties of vitamin B_6 using sophisticated analytical techniques. Vitamin B_6 hydrochloride was divided into two parts, i.e., control and treated parts. Only the treated part has received the Consciousness Energy Healing Treatment (Biofield Energy Healing Treatment) remotely by a well-known Biofield Energy Healer, Dahryn Trivedi. The powder XRD relative peak intensities and crystallite size of the treated vitamin B_6 were significantly altered ranging from -14.27% to 31.89% and -16.68% to 49.87%, respectively compared to the control sample. The average crystallite size of the treated vitamin B_6 was significantly increased by 5.66% compared with the control sample. The particle size values of the treated vitamin B_6 were significantly altered by -11.90% (d_{10}), 5.92% (d_{50}), 20.42% (d_{90}), and 19.05% {D(4,3)}; whereas, the specific surface area of the treated vitamin B_6 was significantly increased by 5.49% compared with the control sample. Similarly, the latent heat of fusion of the treated vitamin B_6 was significantly increased by 34.29% compared with the control sample. The total weight loss and the maximum thermal degradation temperature in the treated vitamin B_6 were slightly increased compared with the control sample. The Trivedi Effect® might have produced a new polymorphic form of vitamin B_6 which would be more soluble, more bioavailable and thermally more stable compared with the control sample. Thus, The Biofield Energy Treated vitamin B_6 could be a more efficacious nutraceutical and/or pharmaceutical formulations against vitamin B_6 deficiency, cardiovascular disease, sideroblastic anemia, pulmonary tuberculosis, diabetes, Alzheimer's disease, pyridoxine-dependency seizures, hyperhomocysteinemia, cancer, asthma, dysmenorrhea, *etc*.

Keywords: The Trivedi Effect®, Consciousness Energy Healing Treatment, Vitamin B_6, Biofield Energy, Crystal size, Particle size, Melting point, Weight loss

1. INTRODUCTION

Pyridoxine (Vitamin B_6) is a water-soluble vitamin used as a cofactor to different enzymatic reactions. It plays an important role in the metabolism of proteins, carbohydrates, and lipids. Besides, it has a significant role in the nervous, endocrine, circulatory and immune systems. It also

maintains the normal blood glucose level in the body [1, 2]. Pyridoxal (aldehyde form) and pyridoxamine (amine form) are two different forms of vitamin B_6 (alcohol form of vitamin B_6). Vitamin B_6, pyridoxamine, and its phosphorylated forms are the major forms of vitamin B_6 in plant foods; while pyridoxal and pyridoxal-5'-phosphate are the main forms obtained in the animal foods. It is also used in cell culture. Pyridoxine hydrochloride is the hydrochloride salt of vitamin B_6 and converted into its active coenzymatic form pyridoxal-5'-phosphate (PLP) [1-4]. Vitamin B_6 is normally used as a dietary supplement and for the treatment of vitamin B_6 deficiency, sideroblastic anaemia, Alzheimer's disease, cardiovascular disease, pyridoxine-dependency seizures, metabolic disorders, hyperhomocysteinemia, pulmonary tuberculosis, anxiety, cancer, attention deficit hyperactivity disorder, asthma, depression, post-partum lactation suppression, dysmenorrhoea, diabetes, osteoporosis, McArdle's disease, problems from isoniazid, mushroom poisoning, etc. [1, 4-7].

Scientific literature extensively raised the problems about the bioavailability of vitamin B_6. Vitamin B_6 has very limited intestinal absorption, large constant elimination rate due to the non-binding properties of vitamin B_6 to the proteins of blood plasma, and instability of vitamin B_6 due to the complex formation with drugs, foods, and cosmetic colours, packaged or canned food stored at elevated temperatures [1, 3, 4]. The Biofield Energy Treatment (the Trivedi Effect®) scientifically proved to be improving physicochemical properties and bioavailability profile of the pharmaceutical/nutraceutical compounds [8-11]. The Biofield is a dynamic electromagnetic field present surrounding the human body, resulting from the continuous movement of the charged particles (ions, cells, etc.) in the body. Biofield constantly releases electromagnetic waves in the form of bio-photons from the body. This electromagnetic wave can spontaneously flow between the human and the environment. Biofield Energy Healing practitioners have the capability to accumulate the energy from the "universal energy field" and can transfer into any object(s) around the earth. In this process, where the objects receive the Biofield Energy and respond to it in a useful way is called as Biofield Energy Treatment [12, 13]. The Biofield Energy Healing therapy has been recognized as a Complementary and Alternative Medicine (CAM) health care approach by the National Center of Complementary and Integrative Health (NCCIH) with other therapies, medicines and practices such as yoga, meditation, Qi Gong, Tai Chi, homeopathy, Ayurvedic medicine, traditional Chinese herbs and medicines, acupressure, chiropractic/osteopathic manipulation, cranial sacral therapy, acupuncture, healing touch, Reiki, hypnotherapy, movement therapy, naturopathy, aromatherapy, etc. [14, 15]. Biofield Energy Healing Treatment is gaining importance in several scientific fields include material science [16, 17], organic compounds [18, 19], microbiology [20-22], biotechnology [23, 24], genetics [25, 26], medical [27], agricultural [28, 29], *etc*. The physicochemical characteristics of any pharmaceutical compound play an important role in drug performance [30, 31]. The Trivedi Effect® has the tremendous potential to modify the physicochemical and thermal properties through the possible intervention of neutrinos [32]. Thus, this research work was designed to evaluate the impact of the Trivedi Effect®-Consciousness Energy Healing Treatment on the characteristic properties of pyridoxine hydrochloride using modern analytical techniques.

2. MATERIALS AND METHODS

2.1. Chemicals and Reagents

The test sample pyridoxine hydrochloride (Vitamin B_6) was purchased from Tokyo Chemical Industry Co. Ltd., Japan. However, other chemicals used in this experiment were purchased in India.

2.2. Consciousness Energy Healing Treatment Strategies

The test sample of vitamin B_6 was divided into two parts. One part of vitamin B_6 was considered as a control sample which did not receive the Biofield Energy Treatment. However, the second part of vitamin B_6 was received the Trivedi Effect® remotely under standard laboratory conditions for 3 minutes by the well-known Biofield Energy Healer, Dahryn Trivedi, USA and known as the Biofield Energy Treated vitamin B_6. This Consciousness Energy Healing Treatment was provided *via* the healer's unique energy transmission process to the test item. Further, the control vitamin B_6 was treated with a "sham" healer, who did not have any knowledge about the Biofield Energy Treatment. After the treatment process, both the samples were kept in sealed conditions and characterized using sophisticated analytical techniques.

2.3. Characterization

The powder X-ray diffraction (PXRD) analysis of vitamin B_6 powder sample was performed with the help of PAN alytical X'Pert3 powder X-ray diffractometer, UK [33, 34]. The average size of crystallites was calculated using the Scherrer's formula (1)

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

Where G is the crystallite size in nm, λ is the radiation wavelength, k is the equipment constant, β is the full-width half maximum, and θ is the Bragg angle [35].

Similarly, the particle size distribution (PSD) analysis was performed with the help of Malvern Mastersizer 3000, UK instrument and Mastersizer V3.50 software using the wet method [19-21, 42]. Further, the differential scanning calorimetry (DSC) analysis of vitamin B_6 was performed with the help of DSC Q200, TA instruments. The thermal gravimetric analysis (TGA) thermograms of vitamin B_6 were obtained with the help of TGA Q50 TA instruments [36, 37].

The % change in crystallite size, peak intensity, particle size, surface area, melting point, latent heat, weight loss, and the maximum thermal degradation temperature of the treated vitamin B_6 was calculated compared to the control sample using the following equation 2:

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

3. RESULTS AND DISCUSSION

3.1. Powder X-ray Diffraction (PXRD) Analysis

The PXRD diffractograms (Figure 1) of both the pyridoxine sample sex habited sharp and intense peaks (Table 1) indicating that vitamin B_6 samples were crystalline in nature. The PXRD diffractograms of both the samples showed the highest peak intensity (100%) at $2\theta = 25.1°$ (Table 1). The relative peak intensities of the treated vitamin B_6 was significantly altered ranging from -14.27% to 31.89% compared to the control sample (Table 1, entry 1-7). The crystallite sizes of the treated vitamin B_6 was significantly altered ranging from -16.68% to 49.87% compared to the control sample (Table 1, entry 1-7). Overall, the average crystallite size of the treated vitamin B_6 (37.11 nm) was significantly increased by 5.66% compared with the control sample (35.13 nm).

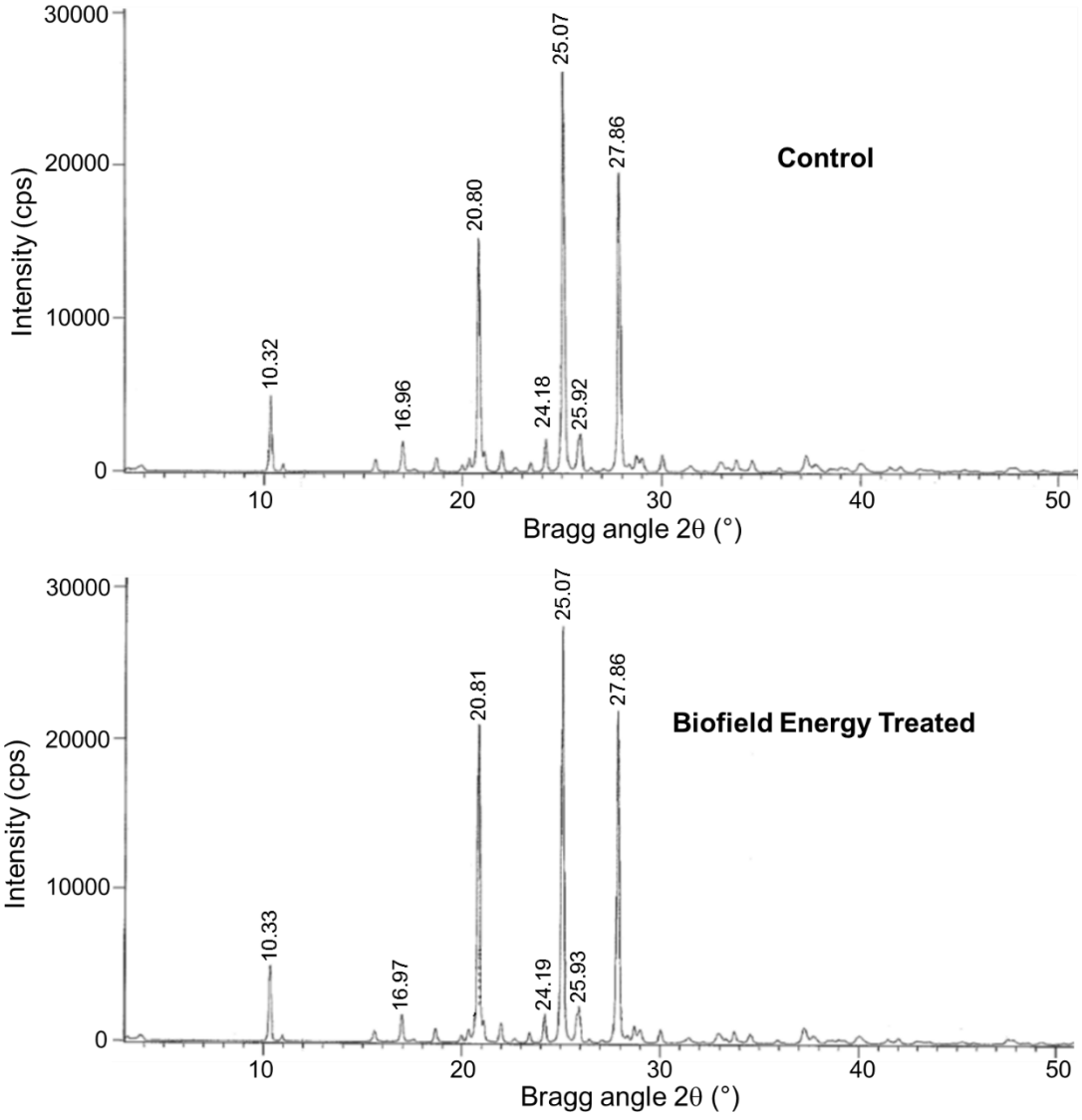

Figure 1. *PXRD diffractograms of the control and treated vitamin B_6.*

Table 1: *PXRD data for the control and treated vitamin B_6.*

Entry No.	Bragg angle (°2θ)	Relative intensity (%)			Crystallite size (G, nm)		
		Control	Treated	% Change	Control	Treated	% Change
1	10.3	18.71	18.35	-1.92	34.55	31.41	-9.10
2	17.0	7.23	6.51	-9.96	34.79	34.80	0.00
3	20.8	58.49	77.14	31.89	34.99	34.99	0.00
4	24.2	7.99	6.85	-14.27	35.20	29.33	-16.68
5	25.1	100.00	100.00	0.00	35.26	44.08	25.02
6	25.9	9.10	8.84	-2.86	39.24	58.82	49.87
7	27.9	73.94	79.75	7.86	44.33	44.33	0.00

This result indicated that crystallinity of the treated vitamin B_6 was significantly increased compared with the control sample. Biofield Energy Treatment has the ability to produce a polymorph by altering the crystal morphology of the pharmaceuticals and nutraceuticals through altering the crystallite size and relative intensities of the characteristic diffraction face [36, 37, 38]. The significant variations in the relative intensities and crystallite size indicated the alteration of the crystal morphology of the Biofield Energy Treated vitamin B_6 compared to the control sample. The Trivedi Effect® - Consciousness Energy Healing Treatment might have produced a new polymorphic form of vitamin B_6. Polymorphic forms of pharmaceuticals have significant effects on the drug performance, such as bioavailability, therapeutic efficacy, and toxicity, because of their impact on the physicochemical properties [39, 40]. Thus, it can be anticipated that Dahryn's Biofield Energy Treatment could be a very useful method for the production of novel vitamin B_6 crystal polymorph which would provide improved therapeutic performance.

3.2. Particle Size Analysis (PSA)

The particle size and surface area of the samples were performed and the results are shown (Table 2). The particle size values of the control sample at d_{10},d_{50}, and d_{90} was 10.92 µm, 33.13 µm, and 116.32 µm, respectively. The average mass-volume diameter {D(4,3)} of the control sample was 51.22 µm. The particle size values of the treated vitamin B_6 at d_{10}, d_{50}, and d_{90} was 9.62 µm, 35.09 µm, and 104.07 µm, respectively. Whereas, the average mass-volume diameter {D(4,3)} of the Treated vitamin B_6 was 60.96 µm. The particle size value at d_{10} in Dahryn's Biofield Energy Treated vitamin B_6 was significantly decreased by 11.90%, whereas the particle size values at d_{50}, d_{90}, and D(4,3)were significantly increased by 5.92%, 20.42%, and 19.05%, respectively compared to the control sample. The specific surface area (SSA) of the treated vitamin B_6 (253.8 m^2/Kg) was significantly increased by 5.49% compared with the control sample (240.6 m^2/Kg). As per the literature pharmaceutical solid compound having reduced particle size and crystallinity with the increased surface area improved solubility, dissolution rate, and bioavailability [40-42]. Thus, it is anticipated that the Consciousness Energy Healing Treated vitamin B_6 might offer better bioavailability than the control sample.

Table 2: *Particle size distribution of the control and treated vitamin B_6.*

Sample	d_{10} (µm)	d_{50} (µm)	d_{90} (µm)	D(4,3)(µm)	SSA(m^2/Kg)
Control	10.92	33.13	116.32	51.22	240.6
Biofield Energy Treated	9.62	35.09	140.07	60.96	253.8
Percent change (%)	-11.90	5.92	20.42	19.02	5.49

3.3. Differential Scanning Calorimetry (DSC) Analysis

DSC is a simple technique to characterize thermal behaviors like melting and crystallization behaviors [40]. The DSC thermogram of the control sample showed only a sharp endothermic peak at 213.75 °C which is the melting point of vitamin B_6 (Figure 2). The melting point of the Biofield Energy Treated sample was increased by 0.29% compared with the control sample (Table 3).

Table 3: DSC data for both control and treated vitamin B_6.

Sample	Melting point (°C)	ΔH(J/g)
Control Sample	213.75	156.60
Biofield Energy Treated	214.38	210.30
%Change	0.29	34.29

The latent heat of fusion (ΔH) of the treated vitamin B_6 was significantly increased by 34.29% compared with the control sample (Table 3). It can be assumed that Dahryn's Biofield Energy Treatment was responsible for the increase the molecular bond strength and crystallization structure of vitamin B_6. Thus, the thermal stability of the Biofield Energy Treated vitamin B_6 was increased compared with the control sample.

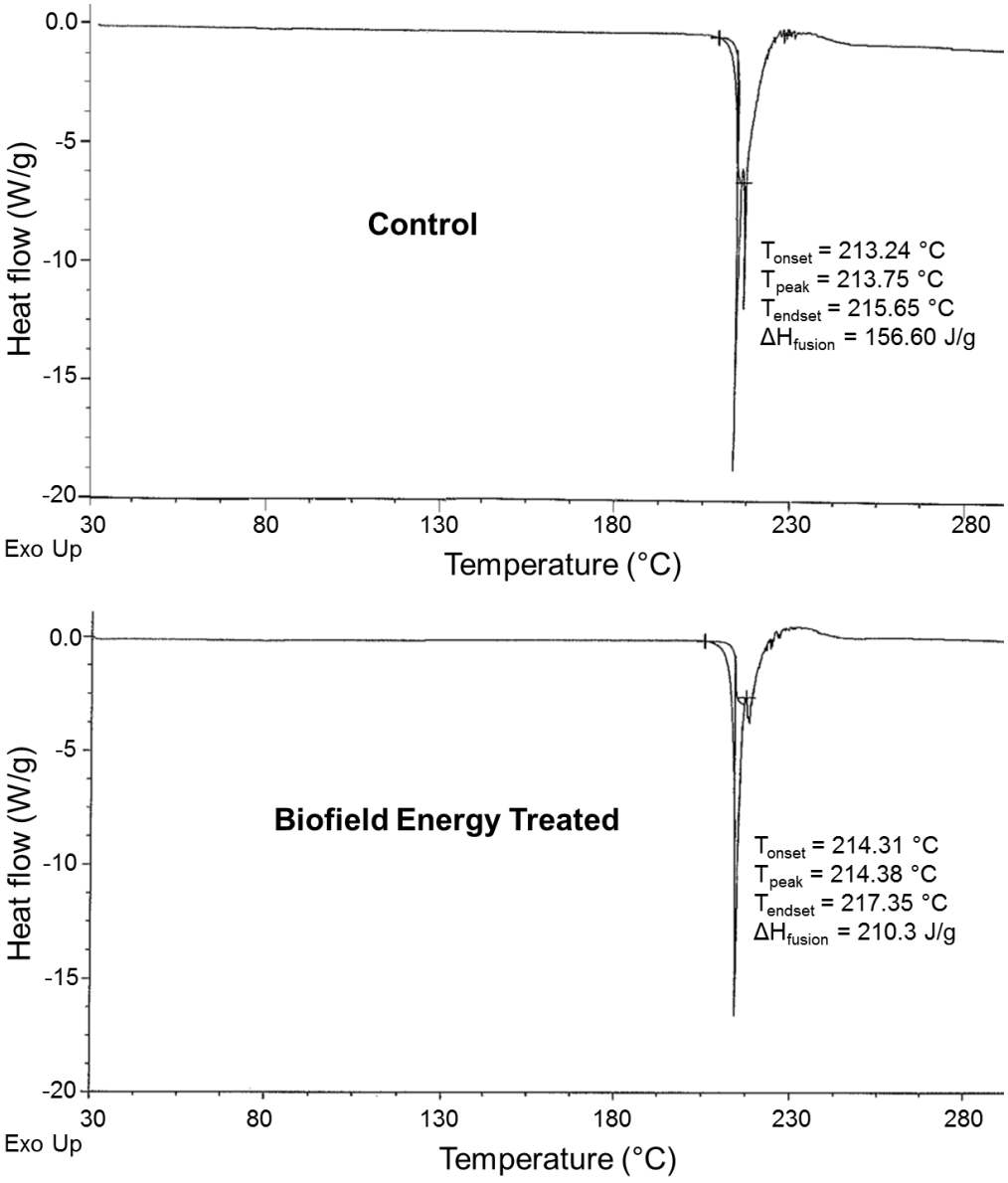

Figure 2: *DSC thermograms of the control and treated vitamin B_6.*

3.4. Thermal Gravimetric Analysis (TGA)/ Differential thermogravimetric analysis (DTG)

The TGA thermograms of both the samples displayed two steps of thermal degradation (Figure 3). As per the literature, vitamin B_6 was stable below 150 °C [43, 44]. Percentage weight loss in the Biofield Energy Treated vitamin B_6 was increased by 1.71% and 0.73% in the 1st and 3rd steps of degradation respectively, whereas the percentage weight loss in the 2nd step degradation was reduced by 0.88% compared with the control sample (Table 4). The total weight loss in the treated sample was slightly increased by 0.36% compared to the control sample (Table 4).

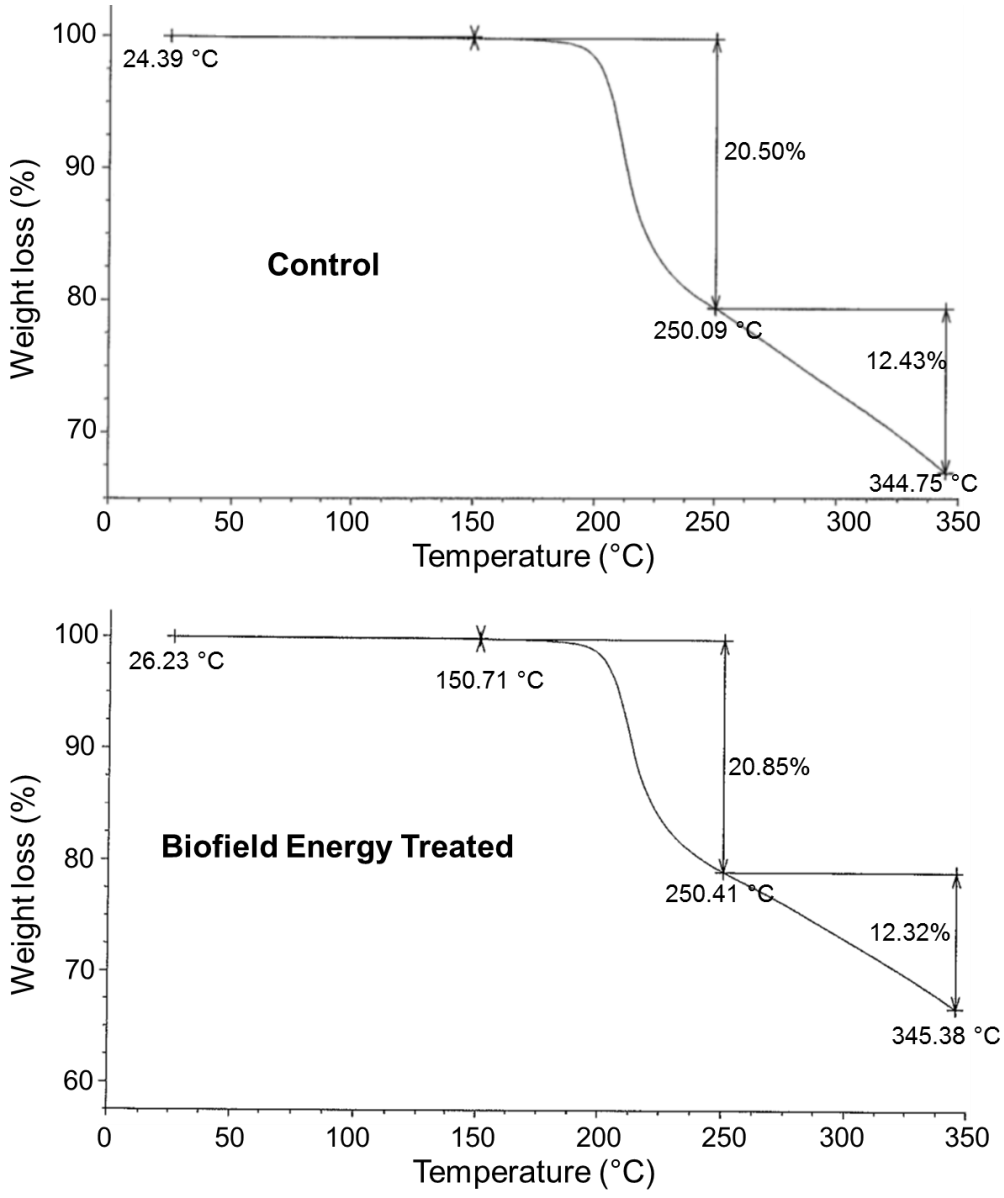

Figure 3: *TGA thermograms of the control and treated vitamin B_6.*

Table 4: *TGA/DTG data of the control and treated vitamin B_6.*

Sample	TGA: Weight loss (%)			DTG
	1st step	2nd step	Total	T_{max} (°C)
Control Sample	20.50	12.43	32.93	211.22
Biofield Energy Treated Sample	20.85	12.32	33.17	211.97
% Change	1.71	-0.88	0.73	0.36

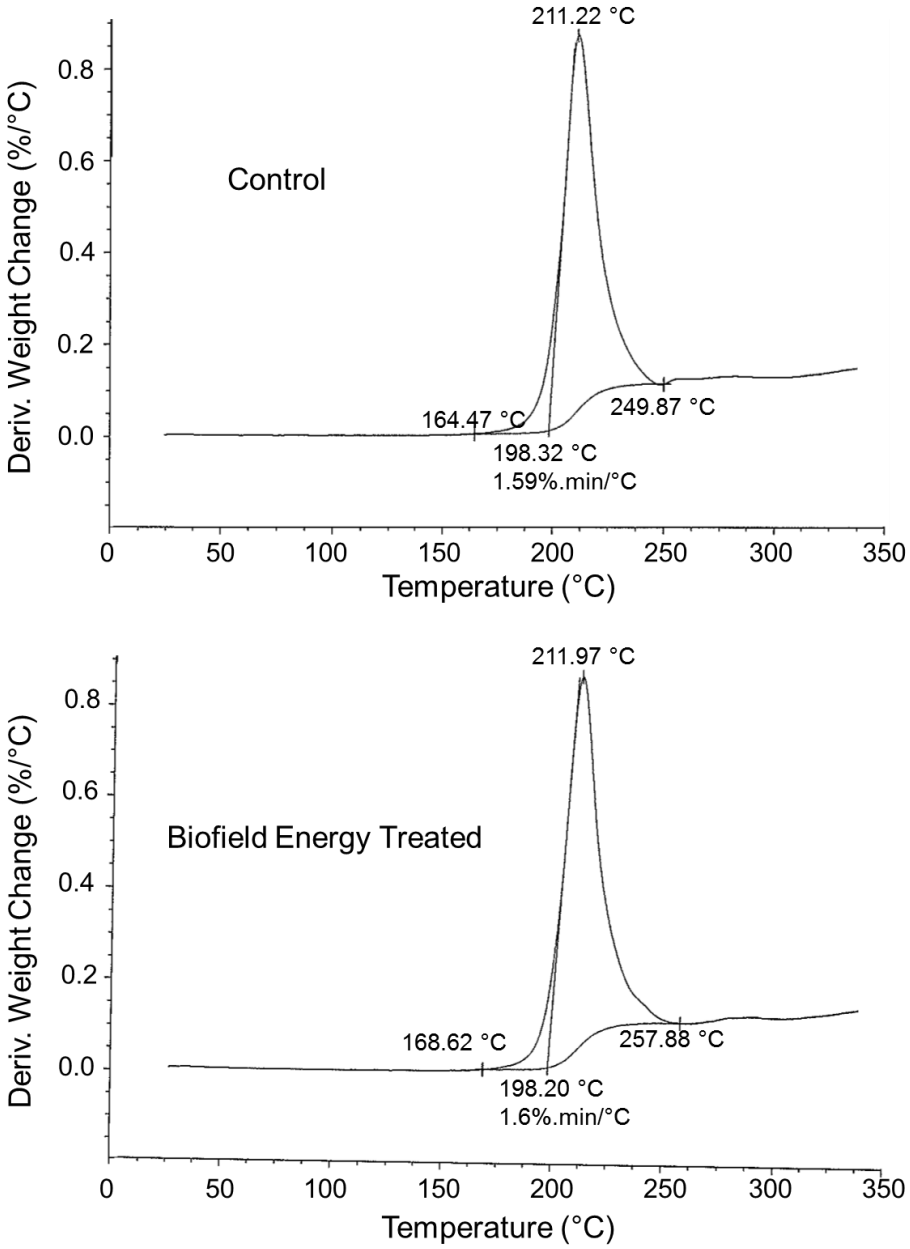

Figure 4: *DTG thermograms of the control and treated vitamin B_6.*

The DTG thermograms of the control and treated samples (Figure 4) exhibited a sharp peak. The control sample was found to be thermally stable up to 211.22 °C, while the Biofield

Energy Treated vitamin B_6 was stable up to 211.97 °C. The T_{max} of the Biofield Energy Treated vitamin B_6 was increased by 0.36% than the control sample (Table 4).

Overall, the thermal analysis which includes DSC, TGA/DTG revealed that the thermal stability of the Biofield Energy Treated vitamin B_6 was increased compared with the control sample.

4. CONCLUSIONS

The Trivedi Effect® -Consciousness Energy Healing Treatment exhibited a significant impact on the relative peak intensities, crystallite size, particle size, surface area, and thermal stability of vitamin B_6. The powder XRD relative peak intensities and crystallite size of the Biofield Energy Treated vitamin B_6 were significantly altered ranging from -14.27% to 31.89% and -16.68% to 49.87%, respectively compared to the control sample. The average crystallite size of the Biofield Energy Treated sample was significantly increased by 5.66% compared with the control sample. The particle size values of the Biofield Energy Treated vitamin B_6 were significantly altered by -11.90% (d_{10}), 5.92% (d_{50}), 20.42% (d_{90}), and 19.05% {D(4,3)}; whereas, the specific surface area of the Biofield Energy Treated sample was significantly increased by 5.49% compared to the control sample. The latent heat of fusion of the Biofield Energy Treated sample was significantly increased by 34.29% compared with the control sample. The total weight loss and the maximum thermal degradation temperature in the Biofield Energy Treated vitamin B_6 were slightly increased compared with the control sample. The Trivedi Effect® might lead to the production of the new polymorphic form of vitamin B_6 which would be more soluble, more bioavailable, and thermally more stable compared with the control sample. Thus, The Biofield Energy Treated vitamin B_6 would be useful to design more efficacious nutraceutical and pharmaceutical formulations which might show better therapeutic response against vitamin B_6 deficiency, premenstrual syndrome, cardiovascular disease, Alzheimer's disease, hereditary sideroblastic anemia, pyridoxine-dependency seizures, metabolic disorders, hyperhomocysteinemia, pulmonary tuberculosis, cancer, anxiety, asthma, attention deficit hyperactivity disorder (ADHD), depression, dysmenorrhea, akathisia, angioplasty, hyperkinetic cerebral dysfunction syndrome, carpal tunnel syndrome, hypertension, lactation suppression, McArdle's disease, osteoporosis, pregnancy-induced nausea and vomiting, breast pain, Tardive dyskinesia, febrile seizures, autism, stroke recurrence, *etc*.

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