

Full Length Research Paper

# Evaluation of the Effect of Consciousness Energy Healing Treatment on Physicochemical and Thermal Properties of *Withania somnifera*

Alice Branton<sup>1</sup>, Mahendra Kumar Trivedi<sup>1</sup>, Dahryn Trivedi<sup>1</sup>, Gopal Nayak<sup>1</sup>, Snehasis Jana<sup>2,\*</sup>

<sup>1</sup>Trivedi Global, Inc., Henderson, USA

<sup>2</sup>Trivedi Science Research Laboratory Pvt. Ltd., Bhopal, India

\*Corresponding Author's Address: Snehasis Jana, Trivedi Science Research Laboratory Pvt. Ltd., Bhopal, India. Tel: +91-022-25811234; Email: publication@trivedieffect.com

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Ashwagandha root extract is a well-known popular health supplement, which is used in many nutraceutical and pharmaceutical formulations for the prevention and treatment of various diseases. This study was performed to evaluate the influence of the Trivedi Effect<sup>®</sup> on the physicochemical and thermal properties of ashwagandha root extract using modern analytical techniques. One part of the test sample was considered as the control sample (no Biofield Energy Treatment), where as the second part was treated with Biofield Energy remotely by a famous Biofield Energy Healer, Alice Branton and was labelled as the treated sample. The particle size values were significantly decreased by 36.96%(d<sub>10</sub>), 20.26%(d<sub>50</sub>), 8.95%(d<sub>90</sub>), and 11.25%{D(4,3)} thus the specific surface area was significantly increased by 27.85% in the treated sample compared to the control sample. The evaporation temperature and latent heat of evaporation of the treated sample were significantly decreased by 14.37% and 84.09%, respectively compared with the control sample. The total weight loss was increased by 11.37%; however, the residue amount was 73.67% less in the treated sample compared with the control sample. The Consciousness Energy Healing Treatment created a new form of ashwagandha root extract which can be used for designing new nutraceutical/pharmaceutical formulations for the treatment of insomnia, hypoglycemia, Huntington's, Alzheimer's, and Parkinson's disorders, etc.

**Keywords:** Ashwagandha root extract, The Trivedi Effect<sup>®</sup>, Consciousness Energy Healing Treatment, Complementary and Alternative Medicine, PXRD, PSA, DSC, TGA/DTG

## INTRODUCTION

*Withania somnifera* (ashwagandha/ Indian ginseng) extract is a very well-known popular component in the nutraceutical/pharmaceutical supplements. It acts as a tonic to arrest the aging process, rejuvenate the body, boost the immune system, and support good health benefits and overall quality of life along with prevention and treatment of various diseases (Kesarwani *et al.*, 2013; Kulkarni *et al.*, 2008; Singh *et al.*, 2011). Among the leaf and root extract of ashwagandha, root extract is very important and used for the treatment of sexual disorders, nervous and immunological disorders, adaptogen /stress, diabetes, cancer, infectious diseases, arthritis, ulcer, etc. (Kulkarni *et al.*, 2008; Singh *et al.*, 2011; Dar *et al.*, 2015; Mir *et al.*, 2012; Mishra *et al.*, 2000). The root extract contains many biologically active phytoconstituents, *i.e.*, withanolides (withanolide A, withanolide B, withanolide D, withferine, etc.), withanamides, alkaloids, sitoindosides, reducing sugars, starch, peroxidases, withanicil, glycosides, benzyl alcohol, dilcitol, 2-phenyl ethanol, cinnamic acid, phenyl acetic acid, benzoic acid, etc. (Kumar *et al.*, 2015; Bolleddula *et al.*, 2012; Mirjalili *et al.*, 2009). Withanolides are highly important and have great pharmacological activities, *i.e.*, immunomodulating, neuroprotective, antioxidant, anti-inflammatory, memory loss, insomnia, hepatoprotective, hypoglycemic, gastrointestinal issues, constipation, antiarthritic, antimicrobial, anticancer, skin conditions, Huntington's, Alzheimer's, and Parkinson's disorders, etc. (Singh *et al.*, 2011; Dar *et al.*, 2015; Mir *et al.*, 2012; Mishra *et al.*, 2000; Singh *et al.*, 2010; Chen *et al.*, 2011; Budhiraja *et al.*, 2000). Therefore, ashwagandha root extract used as

major components in the nutraceutical/pharmaceutical supplements to maintain the overall quality of life and also for the prevention and treatment of various human disorders. Solubility, dissolution, absorption, and bioavailability of the nutraceutical or pharmaceutical compounds are very important to achieve the therapeutic efficacy (Kalepua et al., 2015; Rein et al., 2013).

The Trivedi Effect<sup>®</sup> (Biofield Energy Healing Treatment) has the significant impact on the transformation of the physicochemical properties, i.e., crystallite size, particle size, surface area, thermal properties, bioavailability, etc. of the various object(s) (Trivedi et al., 2015l; Trivedi et al., 2015j; Branton et al., 2017b). The Trivedi Effect<sup>®</sup> is natural and only scientifically proven phenomenon in which a person can harness this inherently intelligent energy from the Universe and transmit it anywhere on the planet through the possible mediation of neutrinos (Trivedi et al., 2016c). There is a unique para-dimensional electromagnetic field exists around the body of every living organism, which generated from the continuous movement of the electrically charged particles (ions, cells, etc.) inside the body known as "Biofield" (A Putative Energy Field). All over the world the Biofield based Energy Healing Therapies have been accepted and reported in many scientific journals with meaningful outcomes against various disease conditions (Rubik et al., 2015; Oschman et al., 2017). The National Institutes of Health (NIH) and National Center for Complementary and Alternative Medicine (NCCAM) recommend and included the Energy therapy under the Complementary and Alternative Medicine (CAM) category along with other therapies, medicines and practices, i.e., homeopathy, Ayurvedic medicine, yoga, meditation, Reiki, acupuncture, traditional Chinese herbs and medicines, aromatherapy, Qi Gong, etc., that has been accepted by most of the U.S. population (Barnes et al., 2008; Koithan, 2009). The Trivedi Effect<sup>®</sup>. Consciousness Energy Healing Treatment also reported their significant outcomes in different field of sciences, i.e., material science (Trivedi et al., 2015a; b), organic chemistry (Trivedi et al., 2015g; h), agriculture (Trivedi et al., 2015c; e), biotechnology (Trivedi et al., 2015d; i), microbiology (Trivedi et al., 2015k; f), nutraceutical/pharmaceutical sciences (Trivedi et al., 2015m; Branton et al., 2017a; c), and medical science (Trivedi et al., 2016a; b). Therefore, the current study was designed to evaluate the influence of the Trivedi Effect<sup>®</sup>-Consciousness Energy Healing Treatment on ashwagandha root extract using powder X-ray diffraction (PXRD), particle size analysis (PSA), differential scanning calorimetry (DSC) analytical techniques, and thermogravimetric analysis (TGA)/Differential thermogravimetric analysis (DTG).

## MATERIALS AND METHODS

### **Chemicals and Reagents**

The *Withania somnifera* (Ashwagandha) root extract was purchased from Sanat Product Ltd., India. All other chemicals used in the experiment were of analytical grade available in India.

### **Consciousness Energy Healing Treatment Strategies**

The test sample "ashwagandha root extract" was divided into two parts. One part was denoted as control sample that did not receive the Biofield Energy Treatment. But, the control ashwagandha root extract was subjected to a "sham" healer under the similar laboratory conditions, who did not have any knowledge about the Biofield Energy Healing Treatment. However, the other part of ashwagandha root extract was considered as a Biofield Energy Treated sample, which received the Consciousness Energy Healing Treatment by a renowned Biofield Energy Healer, Alice Branton, the USA. In the process of Biofield Energy Treatment, the sample was kept under the standard laboratory conditions, and the Biofield Energy Healer provided the Trivedi Effect<sup>®</sup>-Energy of Consciousness Healing Treatment to the sample remotely for 3 minutes through the Unique Energy Transmission process. After the treatment, the control, as well as Biofield Energy Treated ashwagandha root extract samples were kept in similar sealed conditions and further characterized by using modern analytical techniques.

### **Characterization**

#### **Powder X-ray Diffraction (PXRD) Analysis**

The PXRD analysis of ashwagandha root extract was performed with the help of Rigaku MiniFlex-II Desktop X-ray diffractometer (Japan)(Rigaku, 1997; Zhang et al., 2015). The average size of individual crystallites are generally calculated using the Scherrer's formula (1)

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

Where k is the equipment constant (0.94), G is the crystallite size in nm,  $\lambda$  is the radiation wavelength (0.154056 nm for K $\alpha$ 1 emission),  $\beta$  is the full-width at half maximum (FWHM), and  $\theta$  is the Bragg angle (Langford et al., 2017).

### Particle Size Analysis (PSA)

The particle size analysis of ashwagandha root extract was performed on Malvern Master sizer 2000, from the UK with a detection range between 0.01  $\mu\text{m}$  to 3000  $\mu\text{m}$  using wet method (Trivedi *et al.*, 2017a, b).

The percent change in particle size (d) for ashwagandha root extract at below 10% level ( $d_{10}$ ), 50% level ( $d_{50}$ ), 90% level ( $d_{90}$ ), and D(4,3) was calculated using the following equation 2:

$$\% \text{ change in particle size} = \frac{[d_{\text{Treated}} - d_{\text{Control}}]}{d_{\text{Control}}} \times 100 \dots\dots\dots (2)$$

Where  $d_{\text{Control}}$  and  $d_{\text{Treated}}$  are the particle size ( $\mu\text{m}$ ) at below 10% level ( $d_{10}$ ), 50% level ( $d_{50}$ ), and 90% level ( $d_{90}$ ) of the control and the Biofield Energy Treated ashwagandha root extract samples, respectively.

The percent change in the specific surface area (S) was calculated using the following equation 3:

$$\% \text{ change in surface area} = \frac{[S_{\text{Treated}} - S_{\text{Control}}]}{S_{\text{Control}}} \times 100 \dots\dots\dots (3)$$

Where  $S_{\text{Control}}$  and  $S_{\text{Treated}}$  are the surface area of the control and the Biofield Energy Treated ashwagandha root extract, respectively.

### Differential Scanning Calorimetry (DSC)

The DSC analysis of ashwagandha root extract was performed with the help of DSC Q200, TA instruments. The sample of ~0.5-2 mg was loaded to the aluminium sample pan at a heating rate of 10°C/min from 30°C to 350°C (Trivedi *et al.*, 2017a, b). The % change in melting point (T) was calculated using the following equation 4:

$$\% \text{ change in melting point} = \frac{[T_{\text{Treated}} - T_{\text{Control}}]}{T_{\text{Control}}} \times 100 \dots\dots\dots (4)$$

Where  $T_{\text{Control}}$  and  $T_{\text{Treated}}$  are the melting point of the control and the Biofield Energy Treated ashwagandha root extract samples, respectively.

The percent change in the latent heat of fusion ( $\Delta H$ ) was calculated using the following equation 5:

$$\% \text{ change in the latent heat of fusion} = \frac{[\Delta H_{\text{Treated}} - \Delta H_{\text{Control}}]}{\Delta H_{\text{Control}}} \times 100 \dots\dots\dots (5)$$

Where  $\Delta H_{\text{Control}}$  and  $\Delta H_{\text{Treated}}$  are the latent heat of fusion of the control and the Biofield Energy Treated ashwagandha root extract samples, respectively.

### Thermal Gravimetric Analysis (TGA)/ Differential thermogravimetric analysis (DTG)

TGA/DTG thermograms of ashwagandha root extract were obtained with the help of TGA Q50 TA instruments. The sample of ~2-5 mg was loaded to the platinum crucible at a heating rate of 10°C/min from 25°C to 1000°C with the recent literature (Trivedi *et al.*, 2017a, b). The % change in weight loss (W) was calculated using the following equation 6:

$$\% \text{ change in weight loss} = \frac{[W_{\text{Treated}} - W_{\text{Control}}]}{W_{\text{Control}}} \times 100 \dots\dots\dots (6)$$

Where  $W_{\text{Control}}$  and  $W_{\text{Treated}}$  are the weight loss of the control and the Biofield Energy Treated ashwagandha root extract, respectively.

The % change in maximum thermal degradation temperature ( $T_{\text{max}}$ ) (M) was calculated using the following equation 7:

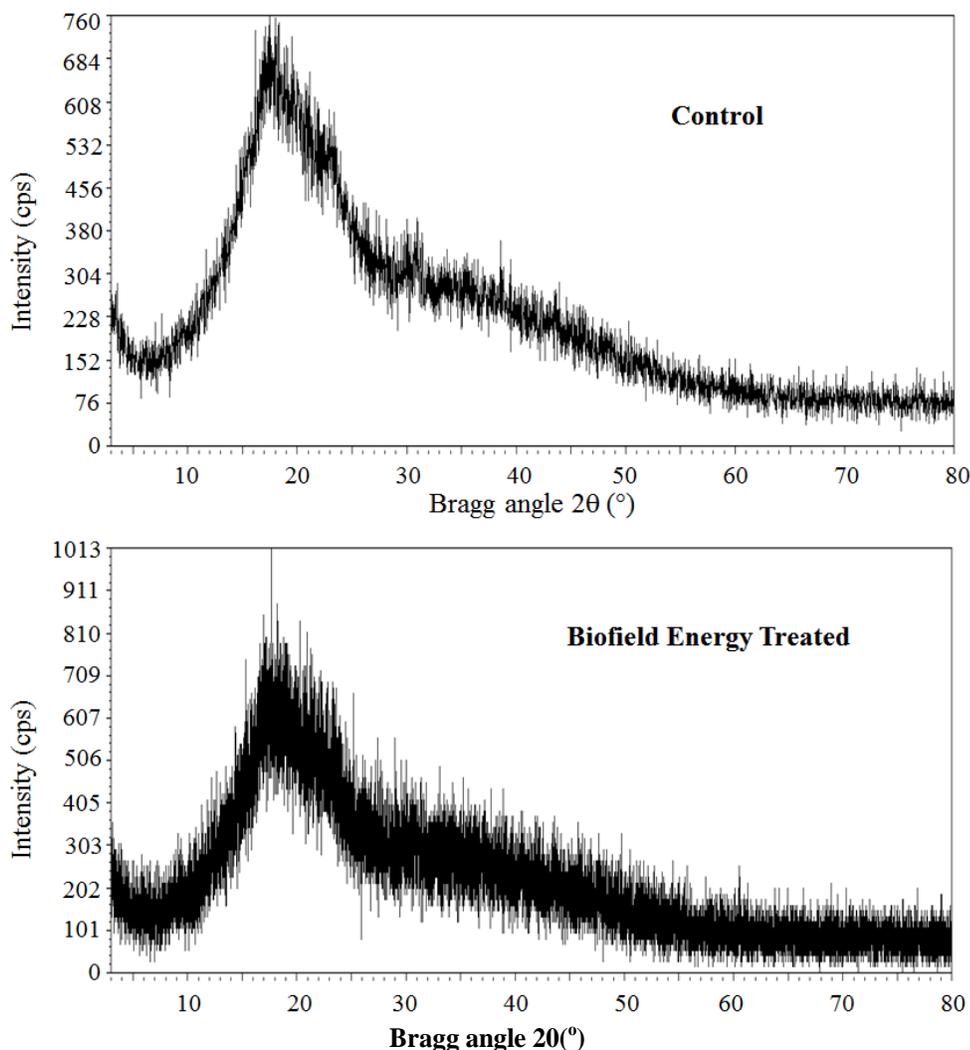
$$\% \text{ change in } T_{\text{max}} (M) = \frac{[M_{\text{Treated}} - M_{\text{Control}}]}{M_{\text{Control}}} \times 100 \dots\dots\dots (7)$$

Where  $M_{\text{Control}}$  and  $M_{\text{Treated}}$  are the  $T_{\text{max}}$  values of the control and the Biofield Energy Treated ashwagandha root extract, respectively.

## RESULTS AND DISCUSSION

### Powder X-ray Diffraction (PXRD) Analysis

PXRD study of the control and the Biofield Energy Treated ashwagandha root extract was performed to determine the crystalline pattern of the samples. The PXRD experimental results of the control and the Biofield Energy Treated ashwagandha root extract samples did not show any sharp and intense peaks in the respective diffractograms (Figure 1). Thus, it is concluded that both samples were amorphous in nature and the Biofield Energy Treatment did not alter the crystallinity pattern of the ashwagandha root extract.



**Figure 1:** PXR D diffractograms of the control and the Biofield Energy Treated ashwagandha root extract.

### **Particle Size Analysis (PSA)**

The particle size analysis of both the control and the Biofield Energy Treated ashwagandha root extract samples were performed, and the results are presented in Table 1. The particle size values of the control samples were 24.7  $\mu\text{m}$ , 63.88  $\mu\text{m}$ , 126.25  $\mu\text{m}$ , and 70.25  $\mu\text{m}$  at  $d_{10}$ ,  $d_{50}$ ,  $d_{90}$ , and  $D(4,3)$ , respectively. Similarly, the particle sizes of the Biofield Energy Treated ashwagandha root extract were 15.57  $\mu\text{m}$ , 50.94  $\mu\text{m}$ , 114.95  $\mu\text{m}$ , and 62.35  $\mu\text{m}$  at  $d_{10}$ ,  $d_{50}$ ,  $d_{90}$ , and  $D(4,3)$ , respectively. Therefore, the particle size values in the Biofield Energy Treated ashwagandha root extract was significantly decreased by 36.96%, 20.26%, 8.95%, and 1.25% at  $d_{10}$ ,  $d_{50}$ ,  $d_{90}$ , and  $D(4,3)$ , respectively compared to the control sample (Table 1). The specific surface area (SSA) of the Biofield Energy Treated ashwagandha root extract (0.28  $\text{m}^2/\text{g}$ ) was significantly increased by 27.85% compared with the control sample (0.219  $\text{m}^2/\text{g}$ ). Hence, it can be assumed that the Trivedi Effect<sup>®</sup>-Consciousness Energy Healing Treatment acts as an external force to breakdown the larger ashwagandha root extract particles to the smaller particle, hence increased the surface area. The particle size, shape, and surface area of a particle have the significant impact on the solubility, dissolution rate, absorption, bioavailability, and even the therapeutic efficacy of a pharmaceutical and nutraceutical compounds (Chereson *et al.*, 2009; Khadka *et al.*, 2014; Buckton *et al.*, 1992). Hence, due to reduced particle size and increased surface area, the surface-active properties of the Biofield Energy Treated ashwagandha root extract would be very high. This improved quality would be more useful for the improvement of solubility, absorption, and bioavailability of the nutraceutical/pharmaceutical formulations having ashwagandha root extract as a prime constituent.

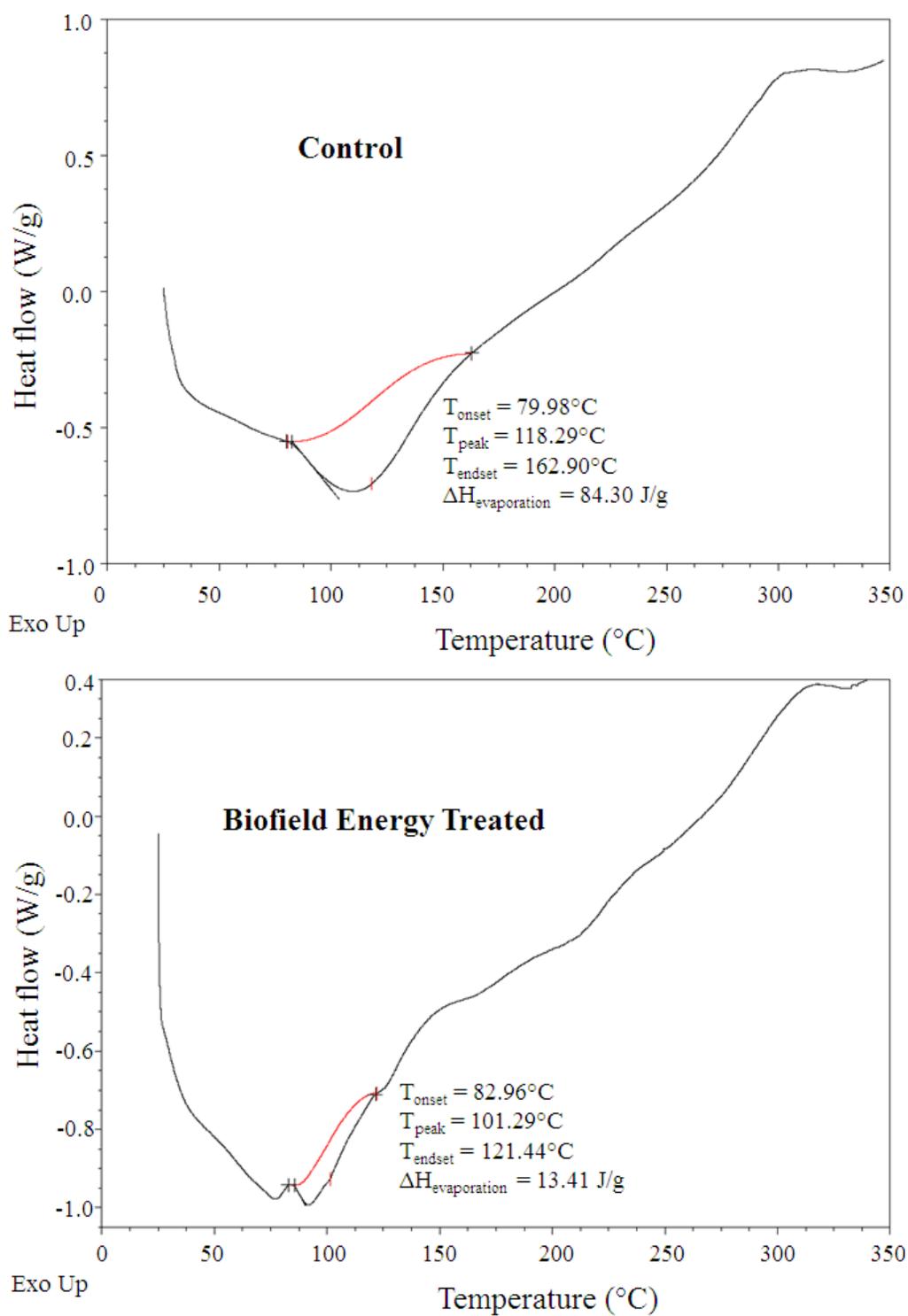
**Table 1.** Particle size distribution of the control and the Biofield Energy Treated ashwagandha root extract.

Parameter	$d_{10}$ ( $\mu\text{m}$ )	$d_{50}$ ( $\mu\text{m}$ )	$d_{90}$ ( $\mu\text{m}$ )	D (4,3) ( $\mu\text{m}$ )	SSA ( $\text{m}^2/\text{g}$ )
Control	24.7	63.88	126.25	70.25	0.219
Biofield Treated	15.57	50.94	114.95	62.35	0.28
Percent change (%)	-36.96	-20.26	-8.95	-11.25	27.85

$d_{10}$ ,  $d_{50}$ , 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 Biofield Energy Treated sample compared with the control sample.

### Differential Scanning Calorimetry (DSC) Analysis

The thermal analysis of both control and the Biofield Energy Treated ashwagandha root extract has been performed to evaluate the impact of the Trivedi Effect<sup>®</sup> on the thermal behavior of ashwagandha root extract. The thermograms of the control and the Biofield Energy Treated ashwagandha root extract samples showed a sharp endothermic peak at 118.29°C and 101.29°C (Figure 2). The endothermic peak was due to the evaporation of the water molecule from the ashwagandha root extract. The evaporation temperature of the Biofield Energy Treated ashwagandha root extract was significantly decreased by 14.37% compared with the control sample (Table 2). However, the latent heat of evaporation ( $\Delta H_{\text{evaporation}}$ ) of the Biofield Energy Treated ashwagandha root extract was significantly decreased by 84.09% compared with the control sample (Table 2). The melting point has been reported to decrease with decreasing particle radius (Antoniammal *et al.*, 2012). Any change in the molecular chains and the crystal structure influence the latent heat of fusion (Zhao *et al.*, 2015). Therefore, Alice Branton's Biofield Energy Treatment could have disturbed the molecular chains and crystal structure of ashwagandha root extract which lead to the decline of the melting point of the treated sample compared to the control sample.



**Figure 2:** DSC thermograms of the control and the Biofield Energy Treated ashwagandha root extract.

**Table 2:** DSC data for both control and the Biofield Energy Treated samples of ashwagandha root extract.

Sample	Evaporation Temperature (°C)	$\Delta H(J/g)$
		Evaporation
Control Sample	118.29	84.3
Biofield Energy Treated	101.29	13.41
% Change*	-14.37	-84.09

$\Delta H$ : Latent heat of evaporation/fusion, \*denotes the percentage change of the Biofield Energy Treated ashwagandha root extract with respect to the control sample.

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

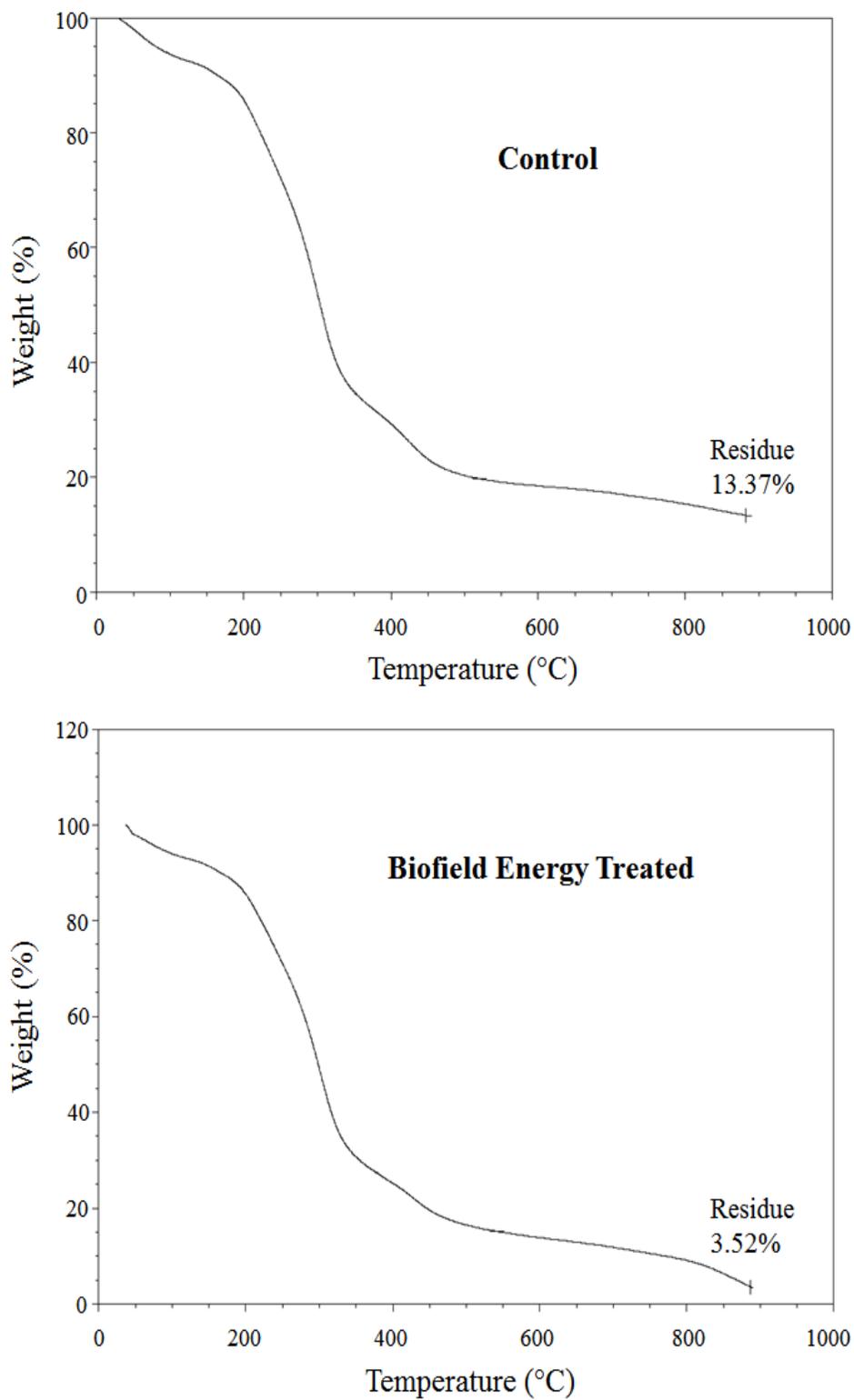
The TGA/DTG thermal analysis was performed, and the thermograms of the control and the Biofield Energy Treated ashwagandha root extract samples are displayed in Figures 3 and 4. The thermograms showed two steps of the degradation process. The total weight loss in the Biofield Energy Treated ashwagandha root extract (86.63%) was increased by 11.37% compared with the control sample (96.48%). Therefore, the residue amount was 73.67% less in the Biofield Energy Treated ashwagandha root extract compared to the control sample (Table 3).

Similarly, the DTG thermograms of the control and the Biofield Energy Treated ashwagandha root extract also reported two peaks (Figure 4). The maximum thermal degradation temperature ( $T_{max}$ ) of the Biofield Energy Treated ashwagandha root extract was almost closer compared with the control sample. Overall, TGA/DTG thermal analysis revealed that the thermal stability of the Biofield Energy Treated ashwagandha root extract was decreased compared with the control sample.

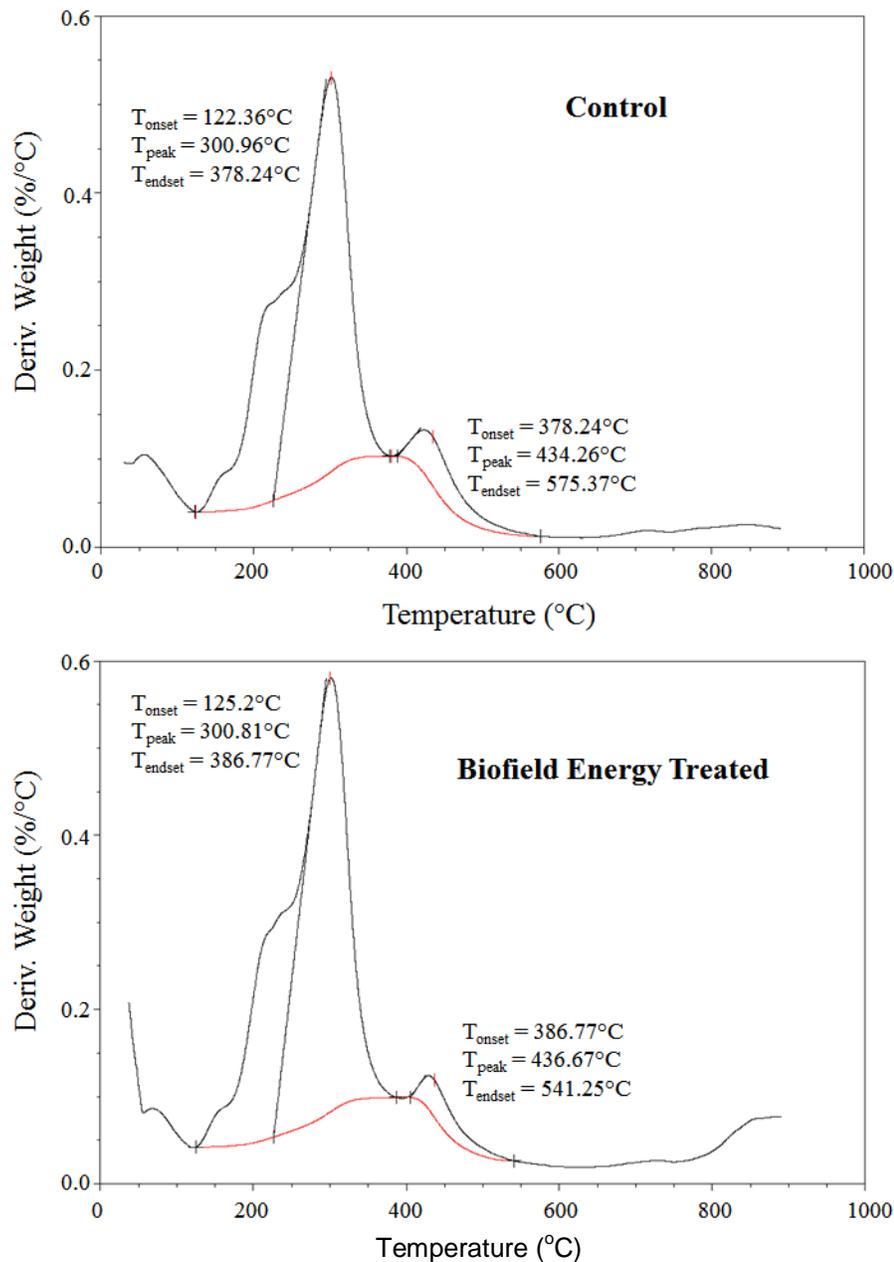
**Table 3:** TGA/DTG data of the control and the Biofield Energy Treated samples of ashwagandha root extract.

Sample	TGA		DTG; $T_{max}$ (°C)	
	Total weight loss (%)	Residue %	Peak 1	Peak 2
Control	86.63	13.37	300.96	434.26
Biofield Energy Treated	96.48	3.52	300.81	436.67
% Change*	11.37	-73.67	-0.05	0.55

\*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.



**Figure 3:** TGA thermograms of the control and the Biofield Energy Treated ashwagandha root extract.



**Figure 4:** DTG thermograms of the control and the Biofield Energy Treated ashwagandha root extract.

## CONCLUSIONS

The Trivedi Effect<sup>®</sup>-Consciousness Energy Healing Treatment has shown the significant impact on the particle size, surface area, and thermal behaviors of ashwagandha root extract. The particle size values of the treated sample were significantly decreased at  $d_{10}$ ,  $d_{50}$ ,  $d_{90}$ , and  $D(4,3)$  by 36.96%, 20.26%, 8.95%, and 11.25%, respectively compared to the control sample. Therefore, the specific surface area of the Biofield Energy Treated ashwagandha root extract was significantly increased by 27.85% compared with the control sample. The evaporation temperature and  $\Delta H_{\text{evaporation}}$  of the Biofield Energy Treated ashwagandha root extract was significantly decreased by 14.37% and 84.09%, respectively compared with the control sample. The total weight loss in the treated ashwagandha root extract was significantly increased by 11.37% compared with the control sample. However, the residue amount was 73.67% less in the case of the Biofield Energy Treated ashwagandha root extract compared to the control sample. It is concluded that the Trivedi Effect<sup>®</sup>-Consciousness Energy Healing Treatment introduced a new form of ashwagandha

root extract which might show better solubility, dissolution, absorption, and bioavailability compared to the control sample. The Trivedi Effect®-Consciousness Energy Healing Treated ashwagandha root extract can be used for designing new nutraceutical/pharmaceutical formulations for the immunomodulating, neuroprotective, antioxidant, anti-inflammatory, memory loss, insomnia, hepatoprotective, hypoglycemic, gastrointestinal issues, constipation, arthritis, antimicrobial, cancer, skin conditions, Huntington's, Alzheimer's, and Parkinson's disorders, etc.

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