



# Evaluation of the Crystal and Particle Characteristics of the Biofield Energy Treated Antimony Metal Powder

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## Abstract

Antimony has many applications in metals, electronics, cosmetics, and pharmaceuticals field. In this study, the influence of the Trivedi Effect<sup>®</sup>-Consciousness Energy Healing Treatment on the physicochemical and thermal properties of antimony powder was evaluated using sophisticated analytical techniques. The test sample antimony powder was divided into two parts. The control sample did not receive the Biofield Energy Treatment, while the Biofield Energy Treated sample received the Trivedi Effect<sup>®</sup>-Consciousness Energy Healing Treatment remotely by a renowned Biofield Energy Healer, Gopal Nayak. The powder X-ray diffraction peak intensities of the treated antimony were significantly altered ranging from -34.44% to 22.53% compared to the control sample. Similarly, the crystallite sizes of the treated antimony were significantly altered ranging from -0.3% to 96.44% compared to the control sample. However, the average crystallite size of the treated antimony was significantly increased by 45.96% compared with the control sample. The particle size values in the treated antimony powder were significantly altered by 39.79% ( $d_{10}$ ), -3.03% ( $d_{50}$ ), 4.12% ( $d_{90}$ ), and 3.49% {D(4,3)}, compared to the control sample. Consequently, the specific surface area of the treated antimony powder (0.693m<sup>2</sup>/g) was significantly decreased by 35.83% compared with the control sample (1.08m<sup>2</sup>/g). The Trivedi Effect<sup>®</sup>-Consciousness Energy Healing Treatment might have generated a new polymorphic form of antimony which would improve the appearance, shape, powder flowability, and thermal stability compared with the untreated sample. The Trivedi Effect<sup>®</sup> Treated antimony would be more useful for designing better pharmaceutical and cosmetic formulations, i.e., antimonials (emetics), meglumine antimoniate, antiprotozoal drugs, anti-schistosomal, veterinary preparations (anthiomaline and skin conditioner in ruminants), nourishing or conditioner of keratinized tissues. It can also be useful for the heavy industries for the production of alloys, solders, electrical cables, fire retardant, bullets, plain bearings, microelectronics, etc.

**Keywords:** Antimony; Consciousness Energy Healing Treatment; The Trivedi Effect<sup>®</sup>; PXRD; Particle size

## Introduction

Antimony (Sb) is found in nature mainly in the form of sulfide mineral stibnite (Sb<sub>2</sub>S<sub>3</sub>). Antimony has four established allotropes, in which one is the stable metallic form and three are metastable forms (black, yellow, and explosive). Antimony has two stable isotopes, such as <sup>121</sup>Sb (57.36%) and <sup>123</sup>Sb (42.64%), 35 radioisotopes and 29 metastable states have been characterized [1]. In the industrial application point of view, antimony has 60% consumption in flame retardants, and 20% is used in alloys for the lead–acid batteries, plain bearings, and solders. The antimony, lead, and tin alloy has improved properties for solders, electrical cables, bullets, and plain bearings [2]. Antimony is used as a stabilizer and a catalyst for the production of polyethylene terephthalate. It has an

emerging demand in microelectronics [2-5]. Antimony compounds since from ancient times were used as medicine and cosmetics, i.e., meglumine antimoniate, antimonials (emetics), antiprotozoal drugs, anti-schistosomal, several veterinary preparations (anthiomaline and skin conditioner in ruminants), nourishing or conditioner of keratinized tissues [2,6]. It is very toxic by inhalation and ingestion, cause dermatitis on prolonged skin contact. It is denser than water, insoluble in water, and slightly oxidized in the air [2,7].

The physical and chemical properties of any substance play a crucial role in manufacturing and other industrial purpose. The Trivedi Effect<sup>®</sup>-Consciousness Energy Healing Treatment

was experimentally proved to have a significant impact on the physicochemical properties of metals, ceramics, pharmaceutical, and nutraceutical compounds [8-11]. The Trivedi Effect® is a natural and lone scientifically established phenomenon in which a person can harness this intelligent energy from the "Universe" and can transfer it anywhere on the planet through the possible mediation of neutrinos [12]. The "Biofield" is a unique energy field exists surrounding the body of every living organisms, which is infinite, para-dimensional electromagnetic field. The Biofield based Energy Therapies have been reported with significant outcomes against various disease conditions [13]. The National Institutes of Health and the National Center for Complementary and Alternative Medicine recommend and included the Energy therapy under Complementary and Alternative Medicine category along with Ayurveda, Reiki, etc., which has been accepted by most of the U.S.A. people [14,15]. The Trivedi Effect®-Consciousness Energy Healing Treatment also proved with significant outcome in various non-living and living object(s), i.e., polymers [16,17], minerals [18,19], organic compounds [20,21], cancer cells [22,23], microorganisms [24,25], and crops [26,27]. This research work was designed to identify the impact of the Trivedi Effect®-Consciousness Energy Healing Treatment on the physicochemical properties of antimony powder using powder X-ray diffraction (PXRD) and particle size analysis (PSA).

## Materials and Methods

### Chemicals and reagents

The test sample antimony powder was purchased from Parshwamani Metals, Mumbai, Maharashtra, India and the other chemicals used during the experiments also purchased in India.

### Consciousness energy healing treatment strategies

The test sample antimony powder sample was divided into two parts and teamed as a control and a Biofield Energy Treated sample. The control sample did not receive the Consciousness Energy Healing Treatment. But, the control sample was treated with a "sham" healer who did not have any knowledge about the Biofield Energy and its treatment (the Trivedi Effect®) procedure. However, the treated part of antimony powder was received the Consciousness Energy Healing Treatment remotely under standard laboratory conditions for 3 minutes through the healer's unique energy transmission process by the well-known Biofield Energy Healer, Gopal Nayak (India). After the treatment, both the antimony

powder samples were kept in sealed conditions and characterized using PXRD and PSA analytical techniques.

## Characterization

### Powder X-ray diffraction (PXRD) analysis

The powder X-ray diffraction analysis of the control and the Biofield Energy Treated antimony powder was performed with the help of Rigaku MiniFlex-II Desktop X-ray diffractometer (Japan) [28,29]. The individual crystallite size was calculated from XRD data by means of the Scherrer's formula (1)

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

Where  $k$  is the equipment constant,  $G$  is the crystallite size in nm,  $\beta$  is the full-width at half maximum,  $\lambda$  is the radiation wavelength, and  $\theta$  is the Bragg angle [30].

The % change in crystallite size of antimony was calculated using the following equation 2:

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

### Particle size analysis (PSA)

The particle size analysis of antimony powder was conducted on Malvern Mastersizer 2000, UK using wet method [31,32]. The percent change in particle size and surface area were calculated using equation 2.

## Results and Discussion

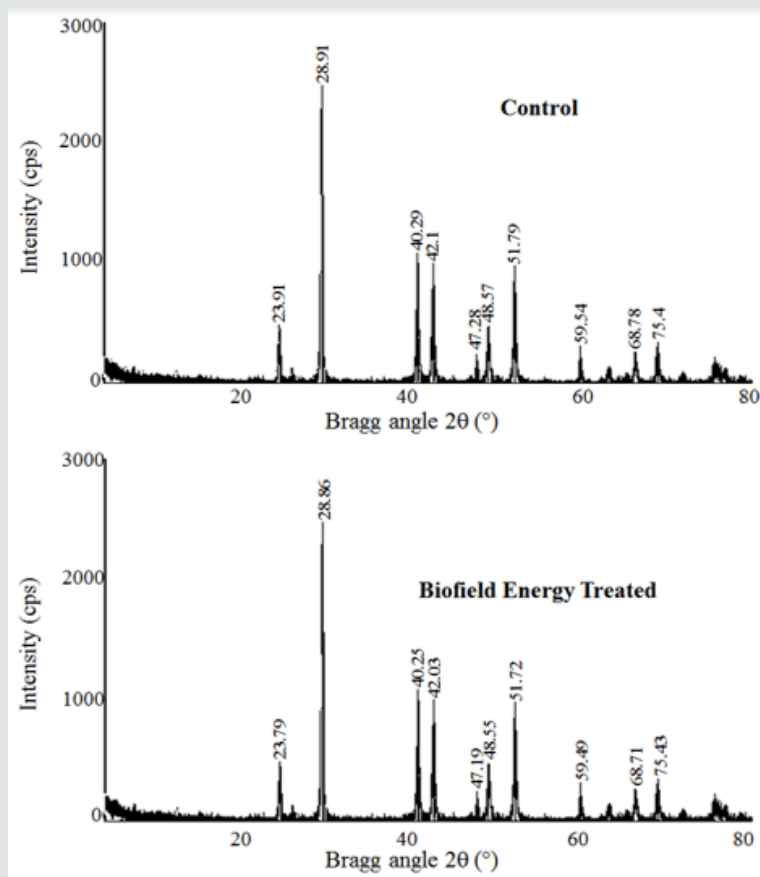
### Powder X-ray diffraction (PXRD) analysis

The powder XRD diffractograms of the control and Biofield Energy Treated antimony showed the sharp and intense peaks (Figure 1) indicated that both the samples were crystalline. The diffractograms of the control and Biofield Energy Treated antimony showed the highest peak intensity at  $2\theta$  equal to  $28.91^\circ$  and  $28.86^\circ$ , respectively (Table 1, entry 2). All the peak intensities of the Biofield Energy Treated antimony were significantly altered ranging from -34.44% to 22.53% compared to the control sample (Table 1, entry 1-10). Similarly, the crystallite sizes of the Biofield Energy Treated antimony were significantly altered ranging from -0.3% to 96.44% compared to the control sample. However, the average crystallite size of the Biofield Energy Treated antimony was significantly increased by 45.96% compared with the control sample.

**Table 1:** PXRD data of the control and Biofield Energy Treated antimony.

Entry No.	Bragg Angle ( $2\theta$ )		Peak Intensity (%)			Crystallite Size (G, nm)		
	Control	Treated	Control	Treated	% change	Control	Treated	% change
1	23.91	23.79	72	47.2	-34.44	309	607	96.44
2	28.91	28.86	488	497	1.84	326	481	47.55
3	40.29	40.25	235	222	-5.53	319	355	11.29
4	42.1	42.03	206	206	0	311	414	33.12
5	47.28	47.19	25.3	31	22.53	341	645	89.15
6	48.57	48.55	105	90	-14.29	262	419	59.92
7	51.79	51.72	208	155	-25.48	318	335	5.35

8	59.54	59.49	39.5	47.4	20	407	656	61.18
9	68.78	68.71	61.3	64.6	5.38	335	334	-0.3
10	75.4	75.43	75	69	-8	140	232	65.71
11	Average crystallite size					306.8	447.8	45.96



**Figure 1:** Powder XRD diffractograms of the control and Biofield Energy Treated antimony.

The modification of the crystallite sizes has a significant impact on the crystal properties of the Biofield Energy Treated antimony compared to the control sample. The peak intensity of each diffraction face of the crystalline compound changes according to the crystal morphology [33]. The alterations in the peak intensities and crystallite sizes provide proof of polymorphic transitions [34,35]. Therefore, the Biofield Energy Treated antimony might have produced new polymorphic form after the Trivedi Effect®-Consciousness Energy Healing Treatment probably *via* the mediation of neutrino oscillation [12]. Different polymorphic forms of any compounds have significant effects on the thermodynamic and physicochemical properties, which are different from the original one [36,37]. The Biofield Energy Treated antimony would be better for designing novel cosmetics or pharmaceutical formulation and also for the other heavy industry applications.

### Particle size analysis (PSA)

The PSA of both the test sample were performed, and the distribution curves are presented in Figure 2. The particle size distribution curve of the Biofield Energy Treated antimony was significantly different compared to the control sample (Figure

2). The particle size values of the control antimony at  $d_{10}$ ,  $d_{50}$ ,  $d_{90}$ , and  $D(4,3)$  were  $2.79\mu\text{m}$ ,  $13.98\mu\text{m}$ ,  $63.98\mu\text{m}$ , and  $25.05\mu\text{m}$ , respectively. Similarly, the particle sizes of the Biofield Energy Treated antimony at  $d_{10}$ ,  $d_{50}$ ,  $d_{90}$ , and  $D(4,3)$  were  $3.9\mu\text{m}$ ,  $13.55\mu\text{m}$ ,  $66.57\mu\text{m}$ , and  $25.93\mu\text{m}$  respectively. The particle size values in the Biofield Energy Treated antimony were significantly altered at  $d_{10}$ ,  $d_{50}$ ,  $d_{90}$ , and  $D(4,3)$  by 39.79%, -3.03%, 4.12%, and 3.49%, respectively compared to the control antimony. The specific surface area of the Biofield Energy Treated antimony powder ( $0.693\text{m}^2/\text{g}$ ) was significantly decreased by 35.83% compared with the control sample ( $1.08\text{m}^2/\text{g}$ ). The Trivedi Effect®-Consciousness Energy Healing Treatment might have acted as an external force for decreasing the internal energy; hence significantly increased the particle size and decreased the surface area of antimony powder particles compared to the control sample. The increased particle size of the antimony powder would be helpful in enhancing the appearance, shape, flowability, and thermal stability of the compound [38,39]. Thus, the Trivedi Effect®-Consciousness Energy Healing Treated antimony would be helpful for designing better nutraceutical or pharmaceutical formulation and also useful for the other industrial applications (Table 2).

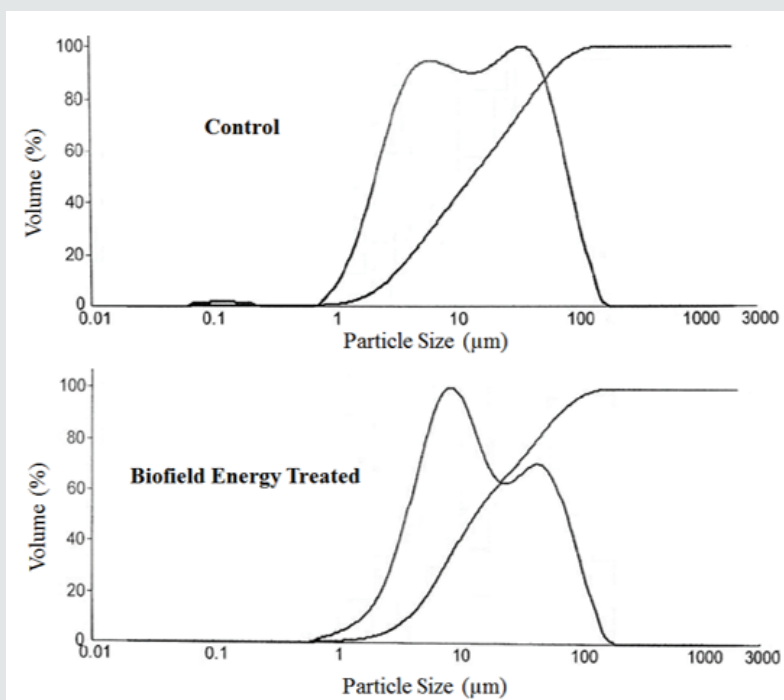


Figure 2: PSD curve of the control and Biofield Energy Treated antimony.

Table 2: PSD data of the control and Biofield Energy Treated antimony.

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	2.79	13.98	63.93	25.05	1.08
Biofield Treated	3.9	13.55	66.57	25.93	0.693
Percent change (%)	39.79	-3.03	4.12	3.49	-35.83

SSA: the specific surface area, and  $d_{10}$ ,  $d_{50}$ , and  $d_{90}$ : particle diameter corresponding to 10%, 50%, and 90% of the cumulative distribution, D(4,3): the average mass-volume diameter.

## Conclusion

The Biofield Energy Treatment (the Trivedi Effect<sup>®</sup>) showed significant effects on the physicochemical properties, i.e., crystallite size, particle size, and surface area of antimony powder. The powder X-ray diffraction peak intensities of the Biofield Energy Treated antimony powder were significantly altered ranging from -34.44% to 22.53% compared to the control sample. Similarly, the crystallite sizes of the Biofield Energy Treated antimony were significantly altered ranging from -0.3% to 96.44% compared to the control sample. However, the average crystallite size of the Biofield Energy Treated antimony powder was significantly increased by 45.96% compared with the control sample. The particle size values in the Biofield Energy Treated antimony powder were considerably altered by 39.79% ( $d_{10}$ ), -3.03% ( $d_{50}$ ), 4.12% ( $d_{90}$ ), and 3.49% {D(4,3)}, compared to the control sample. Consequently, the specific surface area of the Biofield Energy Treated antimony powder ( $0.693\text{m}^2/\text{g}$ ) was significantly decreased by 35.83% compared with the control sample ( $1.08\text{m}^2/\text{g}$ ). The Trivedi Effect<sup>®</sup>-Consciousness Energy Healing Treatment might lead to generate a novel polymorphic form of antimony which would improve the appearance, shape, powder flowability, and thermal stability compared with the untreated

sample. The Trivedi Effect<sup>®</sup> Treated antimony would be more useful for designing better pharmaceutical and cosmetic formulations, i.e., antimionals (emetics), meglumine antimoniate, antiprotozoal drugs, anti-schistosomal, veterinary preparations (anthiomaline and skin conditioner in ruminants), nourishing or conditioner of keratinized tissues. It can also be useful for the heavy industries for the production of alloys, solders, electrical cables, fire retardant, bullets, plain bearings, microelectronics, etc.

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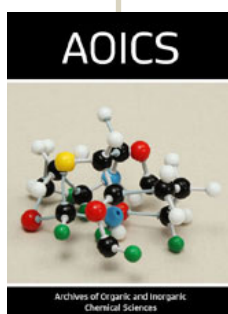
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