

Structural Evolutions in Atoms of the Elements Executing Confined Interstate Electron Dynamics

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Abstract: Differentiating structural evolution from structural development or formation opens many avenues of research. This research particularly broadens the horizon of chemical science. When atoms of a suitable element amalgamate undergo uniformly attained dynamics, they execute confined interstate dynamics of outer ring electrons. Atoms execute electron dynamics in their original zones. For this purpose, atoms of suitable elements first attain a neutral state. Upon the disappearance of the pole forces conserved in nature, the electron instantaneously regains its state. In this way, the electron dynamics for one cycle generate a binding energy shape similar to the path of its dynamics. The exerted forces remain almost in the associated formats of the growth of those atoms. Structures evolve into suitable gaseous element atoms above the ground surface, semisolid atoms at the ground surface, and solid atoms below the ground surface. The structural dimension depends on the number of electrons executing dynamics simultaneously. For gaseous element atoms, binding occurs from the upward sides. The binding atoms in the solid elements are from the downward sides. A nucleated mono-layer binds to another nucleated mono-layer via chemical

forces and engaging chemical energy. The present work also discusses the surface plasmon phenomenon. The structural evolution of atoms of suitable elements discussed here provides a new horizon for material and chemical science.

Keywords: Structure; Conservative force; Dynamics; Chemical force; Chemical energy

1.0. Introduction

In earlier studies, a unit cell defined the basis of solid atoms in describing a crystal structure. Seven crystal systems were used for the conventional studies. According to those studies, the patterns repeat at the points of Bravais Lattices. A Bravais lattice defines a three-dimensional space. However, there is no clue to discussing how the structure could be on practical grounds. The structural development, formation, and evolution should obey different mechanisms than those of Bravais crystal systems. Under the synthetic protocol, a structure develops in colloids, thin films, particles, composites, nanostructures, etc. Here, a discussion is about the development mechanism.

In the developmental process of gold particles, input parameters largely control the force and energy behaviors of the atoms, and they are generated under a synthetic protocol [1]. Observing and visualizing materials down to a resolution of nanometers can reveal the behavior of the ongoing process. It was not the issue with a developing structure. It was the issue of understanding it and discussing it. The applied power source controls the dynamics of atoms, whereas the system parameters are used to study their extrinsic behavior. Structures with different gold shapes were subjected to synthetic protocols [1-5].

Atoms at work, as determined by advanced microscopy, reveal charge dynamics [2]. From the modes of amalgamation of particles in solution, it is possible to trace the force and energy behaviors [3]. From advanced microscopy, it is also possible to observe the structure of tiny-sized particles in terms of atoms [4]. Platinum nanoparticles in solution provide insight into the structure at the nanoscale [5]. In gallium arsenide nanowires, the crystal phase changes under various growth conditions [6]. Tuma *et al.* [7] discussed the physics of the phase transition of neurons from an amorphous state to a crystalline state. Zhao and Yang [8] studied the structure of indium selenide by varying the pressure. Rensberg *et al.* [9] demonstrated a phase transition in vanadium dioxide, where the optical properties changed depending on the attained state.

Studies based on gold particles [1, 3, 4, 10, 11], silver particles and binary composition particles [4], and carbon films [12, 13] have discussed the amalgamations of atoms.

The dynamics involved in developing a triangular-shaped tiny particle have also been discussed [14]. Predictor packing in developing particles with high aspect ratio shapes has been discussed elsewhere [15]. Approximately 25 to 144 gold atoms in the cluster developed a non-face-centered cubic geometric structure, and the face-centered cubic structure was beyond this range [16]. Many studies have also shown live visual images of amalgamating particles. Only some of the studies are cited here [17-21]. An input current in all processes is the photonic current instead of an electric current [22]. Understanding the difference between photons and electrons was also discussed [23]. Different natural forces are exerted at the electron level in gaseous and solid atoms [24].

Carbon atoms in a graphitic state exhibit different behaviors [25]. In the synthesis of carbon films, binding energies at different rates are produced under varying chamber pressures [26].

These studies indicate that semisolid atoms should bind under different conditions than solid atoms. Atoms should address these forces by remaining in their respective growth formats or zones. Gaseous atoms maintain ground points above ground or at the surface level. The binding in gaseous atoms should obey the conditions of the space format.

The atoms of the semisolid elements keep the ground points at ground or surface level. Therefore, they should bind by obeying the conditions of the surface format. The solid element atoms, which maintain ground points much below ground or surface level, can bind further under different conditions. A hard coating develops due to different ground points of solid and gaseous atoms [27].

A structure plays a central role in governing an application. It is a source of energy transportation from the generation point to the consumption point. This study discusses the structural evolution of all suitable element atoms. This study also taps the possibility of the surface plasmon phenomenon in a single-layer tiny particle.

2.0. Experimental details

This work applies to all types of processing and synthesizing materials. The aim of the study is also to improve the material design, simulation, and computation. In addition to the structural evolution of atoms of suitable elements, the current study also helps to understand energy phenomena at the electron level.

The results of the present study can be helpful wherever further research investigations address the structure of a material. A structure can be related to development or formation. This study also helps to understand light-matter interactions. The study also covered areas such as energy science, nanoscience, surface science, and materials science.

Chemical science is a core area of this field. The abundant avenues of research can be opened in light of the work discussed here. More specifically, the present study can verify or study the surface plasmon phenomenon in a single layer of a tiny particle.

3.0. Models and discussion

The forces and energy together bind atoms [11, 14]. According to these studies, a structure was developed by a synthetic protocol. Due to the interstate gap limitation, a carbon atom does not handle the conservative forces exerted by electrons [25]. Therefore, a carbon atom is not eligible for structural evolution.

These highly non-conservative forces remain the cause of the development of hard coatings, as discussed elsewhere [27]. When developing the structure of a material, the localized conditions of the process mainly regulate the extrinsic behavior of the atoms.

To some extent, the extrinsic behavior of atoms depends on their intrinsic nature when synthesizing an electronic or crystalline material. Nevertheless, the purpose of the study here is to evolve structures (instead of developing or synthesizing) in atoms of all suitable elements. This means that the outer ring electrons of those atoms experience conservative forces.

3.1. Structural evolutions of gaseous element atoms

The level of amalgamation of gaseous atoms above the ground surface depends on the ground points. Figure 1 shows the sketch symbolically. To evolve the structure, a suitable electron of the outer ring first reaches the neutral state, which can be just for an instant. In the original zone or format, the outer ring electrons of suitable element atoms can remain in their neutral states. As the original zone of a gaseous atom is the space format or atmosphere, the main force exerted on that electron remains along the north pole.

The contributions of the forces to the electron remain minor along the east-west poles. A force's contribution to the electron can only be along one pole – the east pole or the west pole. Gaseous element atoms mainly evolve gaseous, misty, or vaporous structures.

In Figure 1, electrons positioned at the left and right of the center of a gaseous atom are labeled (1) and (2), respectively. Both electrons maintain an $\sim 5^\circ$ orientation along the north pole. A suitable outer ring electron enters the neutral state by adjusting the energy knots of the remaining lattice of the atom. As energy is already available, that electron leaves the state as per secured conserved forces.

The electron dynamics of one cycle generate binding energy. The electron does not touch the occupied energy knot [23]. The atom controls the lattice from the center. Therefore, that atom can end the neutral behavior of that electron. Therefore, that electron only executes dynamics for one cycle. During the structural evolution of suitable gaseous element atoms, the nature of the involved forces and engaged energy remains cold.

Structural evolution occurs in one dimension when the atoms of suitable gaseous elements execute the dynamics for their one outer ring electron.

The outer ring electrons of the gaseous atoms preserved an orientation of $\sim 5^\circ$ along the north pole before the execution of the dynamics. In the dynamics of two electrons, a structure evolves in two dimensions. The electron dynamics of one cycle generate the binding energy. For the atoms in the gases, the binding energy mainly maintains the levitation nature of the force.

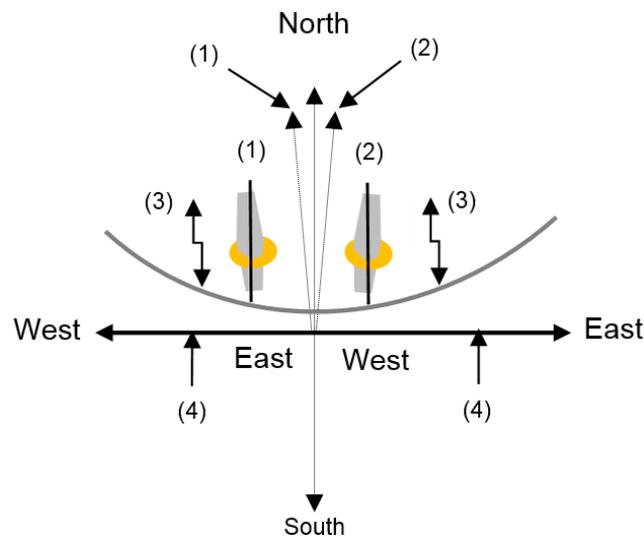


Figure 1: Exerted forces on the electrons of suitable gaseous element atoms to generate binding energy in one cycle of dynamics: (1) orientation of the electron $\sim 5^\circ$ left from the drawn vertical line, (2) orientation of the electron $\sim 5^\circ$ right from the drawn vertical line, (3) ground points of suitable gaseous element atoms and (4) ground or surface level. (Sketch drawn in estimation)

In the space format or atmosphere, an amalgamated atom and a targeted atom bind at the points of their generated energy. The binding of amalgamated atoms to the targeted atom occurs from the upward side. However, the gaseous element atoms that evolve structures need to be studied.

3.2. Structural evolutions of semisolid element atoms

Atoms of suitable semisolid elements amalgamate at the ground level, shown symbolically in Figure 2. To evolve the structure, electrons in the outer ring first maintain a neutral state, which is instantaneous.

Atoms of semisolid elements should grow at a level where they can maintain a neutral state. It is at the surface or ground level. Therefore, the forces exerted on the outer ring electrons of the semisolid atoms remain along all the poles.

In a neutral state, electrons of suitable semisolid atoms maintain an orientation of almost zero degrees along the parallel lines passing through their centers. Figure 2 shows the same orientations of the electrons belonging to all four quadrants labeled (1). The presence of either two or four outer ring electrons is associated with conserved forces when the atoms reach the neutral state. The energy is already there to engage.

In suitable semisolid elements, atoms can execute the dynamics for two or four electrons by maintaining their equilibrium states. Figure 2 shows different poles for left- and right-handed electrons. Figure 2 also shows the forces exerted on the electrons of suitable semisolid atoms.

Figure 2 also shows vertical lines drawn from the centers of left- and right-handed electrons. Each line represents a 0° angle with the electron. In the neutral state of a semisolid atom, suitable electrons in the outer ring experience forces not only along the north-south poles but also along the east-west poles. Therefore, the electrons maintain a still position just before executing the dynamics for generating the binding energy. The binding energy of one cycle of electron dynamics maintains the forces of all four poles.

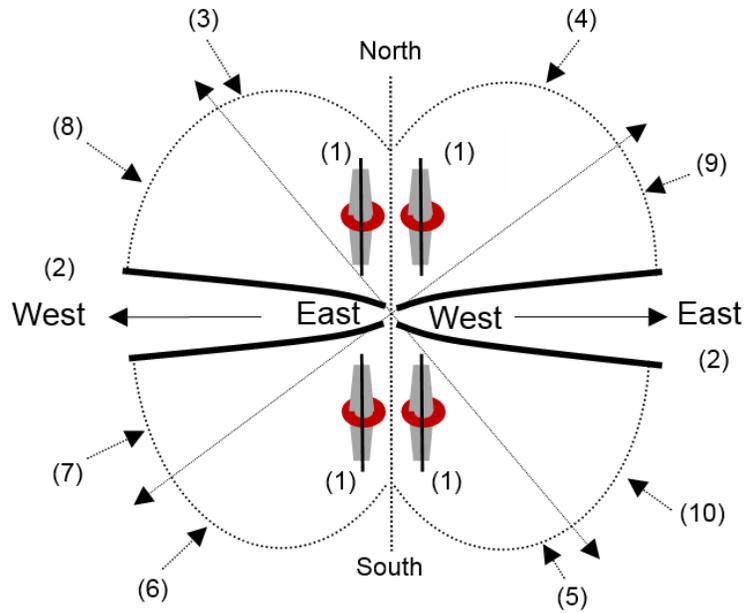


Figure 2: Exerted forces on the electrons of suitable semisolid element atoms to generate binding energy in one cycle of dynamics: (1) vertical lines drawn from the centers of left- and right-positioned electrons, (2) ground points of suitable semisolid element atoms, (3) top left region posterior to the north pole, (4) top right region posterior to the north pole, (5) bottom right region posterior to the south pole, (6) bottom left region posterior to the south pole, (7) bottom west region, (8) top west region, (9) top east region and (10) bottom east region. (Sketch drawn in estimation)

The force distribution is mainly due to the four poles. Figure 2 shows the force distributions in more than four regions for further study. In the surface format, an amalgamated atom and a targeted atom bind at the points of their generated energy. The binding of amalgamated atoms to the targeted atom is horizontal. However, carbon atoms form structures instead of evolving [25].

3.3. Structural evolution of solid element atoms

The atoms of suitable solid elements are amalgamated by keeping the ground points below ground or at the surface level, as shown in Figure 3. The electronic orientation is from the south pole. Labels (1) and (2) in Figure 3 show the same orientations of the electrons. To evolve the structure, a suitable electron belonging to the outer ring first ensures the neutral state, which is instantaneous. A neutral state for the electron of the outer ring nearly remains in the zone of growth of its atom. The main exerted force on the electron remains along the south pole.

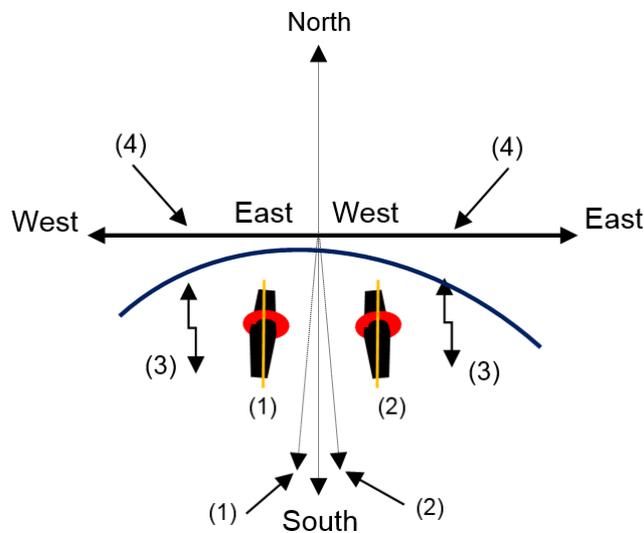


Figure 3: Exerted forces on the electrons of suitable solid element atoms to generate binding energy in one cycle of dynamics: (1) orientation of the left-sided electron $\sim 5^\circ$ left from the drawn vertical line, (2) orientation of the right-sided electron $\sim 5^\circ$ right from the drawn vertical line, (3) ground points of suitable solid element atoms and (4) ground or surface level. (Sketch drawn in estimation)

The contribution of the forces (east or west, or both) related to the surface format is minor. By adjusting the lattice from the center by its atom, the suitable electron of the outer ring attains the neutral state. The energy is already present. Therefore, the electron leaves the state as per the exertion of conserved forces.

When a solid atom executes the dynamics of its suitable electron, the evolution of the structure is one-dimensional. The binding energy mainly reflects the gravitational nature of the force. A grounded format is used below the ground or surface level.

In the grounded format, an amalgamated atom and a targeted atom bind at the points of their generated energy. The binding of amalgamated atoms to the targeted atom occurs from the downward side. Different element atoms can evolve into different types of structures.

3.4. Binding energy

Energy engagement triggers the execution of electron dynamics, as discussed in sections 3.1., 3.2., and 3.3. Path-independent but state-dependent forces are exerted on the electrons of the outer ring. Therefore, an atom under electron dynamics generates binding energy while involving conservative forces. The shape of the binding energy depends on the nature of the atomic element.

With respect to suitable atoms of the gaseous, semisolid, or solid elements, the shape of the binding energy for one cycle of electron dynamics depends on the interstate gap or distance. When the forces exerted on the electron are related to only two poles, the binding energy is a tick symbol. Figure 4 (a) shows this.

When the forces exerted on the electron are related to only three poles, the binding energy generated along the trajectory of its dynamics has a shape similar to an integral symbol, as shown in Figure 4 (b). When the forces exerted on the electron are related to all four poles, the binding energy generated along the trajectory of its dynamics has a shape similar to the Gaussian distribution of turned ends. Figure 4 (c) shows this.

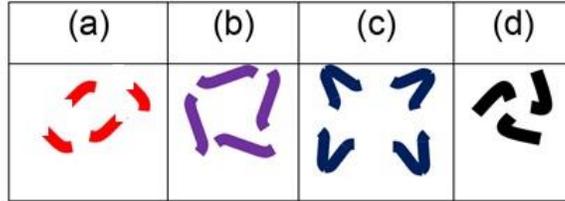


Figure 4: Binding energy in the (a) tick, (b) integral, and (c) Gaussian distributions of the turned ends, and (d) *L* alphabet shapes

Three outer ring electrons can execute the interstate dynamics of atoms in a suitable element. In the outer ring, an electron traces an orientation at 120° in an atom. A nearby unfilled state of the outer ring should also follow the same scheme. When each outer ring electron executes dynamics simultaneously for one cycle in a slightly disturbing manner due to the presence of the pole of an atom, the binding energy is *L* alphabet shaped, as shown in Figure 4 (d).

For different atoms, the binding energy is due to the trajectory of the dynamics of an electron. Forces from two poles are exerted on the electron at each time of dynamics [23]. Figure 4 (a-d) shows the different shapes of the binding energy.

Atoms of suitable elements generate photon energies with different characteristics under confined interstate dynamics for many cycles [23]. By preserving the conditions of the space and grounded formats at the ground or surface level, gaseous and solid atoms can also evolve structures at the ground or surface level. This approach can open many avenues of research.

3.5. Three-dimensional structural evolution

The evolution of three-dimensional structures is possible for suitable element atoms when their three outer ring electrons execute confined interstate dynamics. The

positions of 3 electrons in the solid or gaseous atom should be at a difference of 120° when plotting an outer ring. Here, the execution of the dynamics of each electron generates a binding energy shaped as the *L* alphabet.

The generated energy under one cycle of an electron has a shape similar to the *L* alphabet, as shown in Figure 4 (d). In the evolving three-dimensional structure, when attempting to transfer to the appropriate unfilled state, a suitably positioned electron cannot entirely cross the dedicated pole of the solid or gaseous atom. The retrieval of that electron occurs without contacting the nearby unfilled state or energy knot.

The electron faces a specific portion of the energy knot. The electron retrieves to the original state without occupying the unfilled state. The remaining two electrons of the outer ring also execute dynamics in the same manner. All three outer ring electrons attempted to cross the dedicated poles. Each positioned electron generates an energy shape similar to the *L* alphabet in the single execution of dynamics. Such evolved structures of solid atoms maintain a naturally finished surface.

These atoms undergo partial lateral and partial adjacent binding to evolve their structure. Due to the minute level of turning force involved in the binding energy, these structures maintain minimum ductile behavior in solid atoms.

The atoms of suitable elements maintain the forces of the three poles executing interstate dynamics for each outer ring electron. However, there is a need to trace the gaseous and solid atoms suitable for evolving three-dimensional structures.

3.6. Structural evolution of silicon atoms

Upon attaining the neutral state, the outer ring electrons of the silicon atom can handle the forces of all four poles in a conserved manner. A silicon atom keeps the ground point at ground or surface level, so the interstate dynamics of electrons are mainly executed in the surface format. Nonetheless, the elements of levitational and gravitational forces are also involved, and a detailed study of these forces is given elsewhere [23]. Two amalgamated silicon atoms bind to the targeted silicon atom at the points of generated energy.

It is important to note that each amalgamated atom also executes confined interstate dynamics of two outer ring electrons. Thus, a structure of two dimensions evolves, as shown in Figure 5 (a).

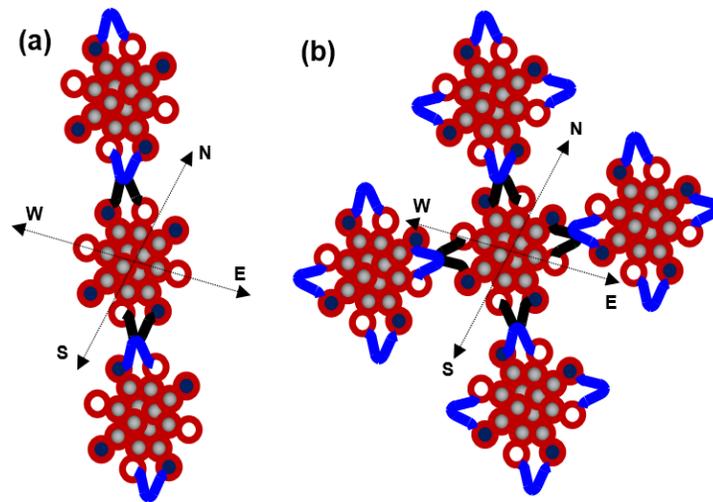


Figure 5: (a) Two-dimensional structure evolution in silicon atoms with confined interstate dynamics for two electrons and (b) four-dimensional structure evolution in silicon atoms with dynamics for four electrons. (Sketches drawn in estimation)

It is important to note that each amalgamated atom also executes confined interstate dynamics of four outer ring electrons. Hence, a structure of four dimensions evolves, as shown in Figure 5 (b). In this case, four amalgamated silicon atoms bind to the targeted

silicon atom at the points of generated energy. More work is needed to obtain a complete picture.

It is essential to realize that the generated binding energy of an atom under the dynamic action of an electron in one quadrant would disturb the balance required for the equilibrium state of a silicon atom. Therefore, silicon atoms do not evolve structures in one dimension. However, additional work is needed.

The generated binding energy of the atom under the dynamics of three electrons in three quadrants would also disturb the balance required for the equilibrium state of a silicon atom. Therefore, silicon atoms do not evolve structures in three dimensions. However, additional research is needed.

3.7. Binding of mono-layer shapes

Two nucleating mono-layers bind in parallel by involving forces and engaging conserved energy in their behaviors. When binding to mono-layers, atoms align with the orientation of the electrons. Binding in mono-layers is due to the chemical activity of the conserved forces and energy.

In the evolution process, the structure grows both lengthwise and widthwise. Usually, the forces function from a distance, but the energy acts locally. When binding to mono-layers, atoms preserve their force energy, which is chemical at the electron level.

Lateral binding of the mono-layers involves forces and engages energy in a dot-shaped bed. However, further studies are required to investigate the binding of different element atoms to single layers.

The presence of a dot-shaped bed between mono-layers is due to the activities of forces and energy. A chemical in nature, the force-energy trap between mono-layers is conserved, settling the binding atoms' expansion and contraction. The harmonized forces and energy in the binding mono-layers are unrelated to the photons. The dot force in the mono-layers of suitable gaseous element atoms can be related to their levitating nature.

However, the dot force in the mono-layers of suitable solid element atoms is related to their gravitational nature. However, additional studies are needed to investigate this phenomenon in detail.

3.8. Possibility of the surface plasmon phenomenon in a mono-layer tiny particle

As discussed in many studies, a surface plasmon phenomenon mainly occurs in the developing tiny particles. In this phenomenon, the atomic lattices of a tiny-sized particle collectively oscillate upon trapping the traveling photons. Atoms are more or less modified in their developed tiny particles.

High-resolution transmission microscopy images published in the literature show different shapes of atoms of tiny particles, which validates their different modification behaviors. A surface force is exerted on the electrons of atoms at the surface or ground level. Avoiding the exertion of that force is a grand challenge.

In the development process of a tiny particle, atoms of suitable elements do not retain their original shapes. As a result, the bound atoms should not oscillate collectively. The trapping of photons by the atomic lattices of a tiny-sized particle is also

not viable. Photons can either reflect or break under the interactions with a medium. These separate studies are discussed elsewhere [23, 28].

It is possible to observe a surface plasmon polariton phenomenon or surface plasmon resonance phenomenon under suitable arrangements. However, a tiny particle should evolve its structure rather than develop. There should be a mono-layer of atoms only.

If the execution of the surface plasmon phenomenon is possible, an evolved tiny particle should retain a suitable number of atoms. The photons should travel with the required energy. The photons should travel in a specific direction concerning the tiny-sized particle with a mono-layer.

There can be other conditions for studying the surface plasmon phenomenon for a tiny particle. It will be a wonder to see if the atomic lattices of a tiny-sized particle collectively oscillate upon experiencing traveling photons. A mono-layer tiny particle retains the same atomic shape during its evolution. It is fascinating to see the execution of a surface plasmon phenomenon and the resulting outcomes in tiny-sized particles.

To execute the surface plasmon phenomenon, photons of the required characteristics should travel under the diligent setting. The photons should travel for one instant parallel to the surface of a single-layer tiny particle. For the next instant, the photons should travel from the opposite end. To realize a surface plasmon phenomenon for suitable tiny-sized matter, the process of traveling photons should remain intact within the required interval. The photons traveling from the surface of a tiny particle can lead to back-and-forth oscillations.

The difference between these phenomena is that a surface plasmon polariton phenomenon is considered more intensive than a surface plasmon resonance phenomenon. The possibility of two surface plasmon phenomena is in the context of the new atomic structure discussed elsewhere [24].

A surface plasmon phenomenon is not feasible in the context of the atomic structure presented in earlier studies. An electronic configuration in the form of shells or orbits along with protons and neutrons in the nucleus does not favor atoms to execute collective oscillation of their tiny-sized particles while trapping traveling photons. However, an electronic configuration in the form of energy knots occupying electrons along with a zeroth ring can favor atoms executing collective oscillation of tiny-sized particles while experiencing traveling photons in a suitable scheme. A study elsewhere [24] discussed such arrangements of atomic structures, which is good for consideration for future research.

3.9. Discussion

For atoms of different elements, the shape of the binding energy varies depending on the dynamics of an outer ring electron within the built-in interstate gap (or between the relevant states). In attaining neutral behavior, the electrons of gaseous atoms maintain an orientation of $\sim 5^\circ$ along the north pole [24].

Moreover, in attaining neutral behavior, the electrons of solid atoms maintain an orientation of $\sim 5^\circ$ along the south pole. Again, electrons of semisolid atoms maintain an orientation almost parallel to the vertical lines passing through their centers [24]. Particles develop with different geometries due to varying the electronic orientations of

the atoms [28]. However, entropy is due to the consistently plastically-driven electronic states of the atoms [29]. Several studies have discussed the phenomena of surface plasmon polaritons and surface plasmon resonance. Only a few of them are cited here [30-55].

For the evolution of structures in suitable gaseous and solid atoms, there is a need to develop a setup of space and grounded formats at the ground or surface level. An evolved structure of a material should undergo a different X-ray analysis than a developed structure. Many new research avenues can be opened to consider this point.

Different extracted ores are processed to obtain atomic compositions in pure form. However, when atoms are dissociated from the precursor or ejected from the source target, they amalgamate or deposit to develop materials with different properties.

During the development of a material, atoms undergo different modifications. In developing a material, the forces and energy are not conserved. In structural evolution, forces and energy are conserved. Therefore, atoms maintain their state as it is, not modify it. Research on the structural evolution of suitable element atoms can open new fields of study.

4.0. Conclusion

By keeping ground points in the original format, atoms of suitable elements evolve structures. Before binding, atoms amalgamate through uniformly attained dynamics. Conserved forces are exerted on the electrons of the outer rings of atoms to conserve energy within the interstate gaps.

The engagement of energy is due to the involvement of forces first. Before the execution of dynamics, an atom instantaneously reaches the neutral behavior of a suitable electron. One-dimensional structures of suitable element atoms can evolve if one outer ring electron undergoes dynamics.

In atoms of those elements where three outer ring electrons execute the dynamics, the evolution of the structure is three-dimensional. When two poles are exerted on an electron, the generated binding energy maintains the shape of a tick symbol. If two outer ring electrons of the atoms execute the interstate dynamics, the structure evolves in two dimensions. If the forces exerted on each electron consist of three poles, they generate energy in an integral symbol shape to bind the atoms. However, at one time, only two forces are exerted [23].

If the forces exerted on the electron consist of three poles that have some disturbance at the end, the generated binding energy maintains the shape of the *L* alphabet. This is due to the presence of the pole of an atom there. These element atoms evolve structures in three dimensions due to the execution of the dynamics of three outer ring electrons. The position of each electron remains at $\sim 120^\circ$ from the other.

The structure of suitable semisolid atoms is four-dimensional according to four-electron dynamics. Here, the shape of the generated binding energy is similar to the Gaussian distribution of the turned ends. Suitable semisolid element atoms bind adjacently to the targeted atom. Suitable solid element atoms bind laterally from the downsides. Binding in the structural evolution of suitable gaseous atoms occurs from the upward sides. The electron dynamics of one cycle generate binding energy.

An electron regains its state by following the same path as the generated binding energy. For solid atoms, the binding of mono-layers occurs from the downward side. The binding of mono-layers of suitable gaseous element atoms is from the upward side. Mono-layers of bound atoms bind due to the chemical activity of conserved forces and energy. A surface plasmon phenomenon exists in the evolved structure of a single-layer tiny particle as the electronic configuration of all the atoms remains alive.

During the development of a single-layer tiny particle, atoms do not maintain the same electronic orientation as in their original state. Therefore, they cannot execute different surface plasmon phenomena.

A tiny particle in the mono-layer can experience the traveling photons under suitable conditions to oscillate its atoms collectively. How do the atoms attain a neutral state?

How can a cluster of a few atoms oscillate collectively under a suitable arrangement of photons? Such questions leave an intriguing note. It is challenging for chemists to quantify the rates of these activities and their consolidation. The presented investigations enable one to study the structures with their optimum features.

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