Atoms of None of the Elements Ionize While Atoms of Inert Behavior Split by Photonic Current

Mubarak Ali
Department of Physics, COMSATS University Islamabad, Islamabad Campus, 45550, Park Road, Pakistan, mubarak74@mail.com, mubarak60@hotmail.com,
http://orcid.org/0000-0003-1612-6014

Abstract: It is customary to refer to atoms by stating positive or negative charges when they lose or gain electrons. However, thinking about the related principles and phenomena of ionization has become confusing. It is also necessary to realize that atoms of suitable elements can execute the interstate dynamics of qualified electrons. Atoms also undertake transition states. Atoms can elongate. Atoms can expand. Atoms can contract. Under a suitable input power, flowing inert gas atoms can split. Upon splitting, inert gas atoms are converted into electron streams. By carrying photons, when electron streams impinge on atoms, atoms with solid behavior further elongate. Otherwise, elongated atoms at least deform. These atomic behaviors validate that they cannot ionize. When the flowing inert gas atoms split, the characteristics of the photons become apparent. The splitting of inert gas atoms, the carrying of photons by electron streams, and the lighting of traveling photons validate that an electric current is a photonic current. The surface and interface images of differently processed materials resulting from various microscopic investigations are due to the resolving powers of the characteristic photons. Several well-known principles also validate that an electric
current is a photonic current. This study enables us to understand the basic and applied sciences.

*Keywords:* Atoms; Photons; Photon-matter interaction; Photonic current; Bandgap

1.0. Introduction

It is customary to consider a negative or positive charge when the atom gains or loses an electron. Therefore, these customs form the basis of a chemical or physical process. Ions are the species that possess either a net negative or a net positive charge.

The net negative charge is an anion that attracts toward the anode. A cation is not like that. The ion has several electrons that are not related to the number of protons. An ion is an atom with a net electrical charge [1]. An anion is due to a gain of an electron by the atom. In published literature, this is also called a negatively charged ion. A cation is due to losing an electron by the atom. In the published literature, this is also called a positively charged ion.

In physical science, ion pairs, consisting of a free electron and a positive ion, form due to the impact of an ion [2]. During the processing of salt solutions in 1884, Sir Svante Arrhenius discussed the formation of Faraday ions [3]. An award of the Nobel Prize for performing work on the equation of state was given in 1910. However, the study of van der Waals interactions has been a topic of intense debate [4].

To develop different materials, the voltage multiplied by the current equal to the power is used to determine the source of the electric current. The flow of electrons or charged particles refers to the electric current in all the processes, methods, and
phomena utilizing and consuming power. This is not the case at all in the current study.

The force exerted at the electron level determines the energy behavior of an amalgamating nanoparticle or particle in solution [6]. The development of shaped particles under varying concentrations of gold precursors has been discussed [7]. In the development of tiny-shaped particles, different precursors have been investigated [8].

Tiny particles, nanoparticles, and particles develop at different pulse rates [9]. Tiny particles pack, developing nanoparticles and particles [10]. In a pulse-based process, a detailed method for developing high aspect ratio gold particles was discussed [11].

A carbon film delivers enhanced field emission due to the deposition of many tiny graphitic carbon grains [12]. The growth habit of grains and crystallites changes under slight variations in the localized conditions of the process [13]. The atomic arrays of tiny-shaped particles can be converted into smooth structures [14]. Different structural evolutions are due to the execution of confined interstate electron dynamics of atoms [15]. By considering the silicon atom, the phenomena of heat and photon energy were revealed [16]. X-ray diffraction is related to X-ray reflection and can be used to study new atomic structures [17]. Solid and gaseous atoms establish different relationships of force and energy under transitional behaviors [18].

A study elsewhere [19] considered a carbon with different states but a fixed number of electrons. In hard coatings, atoms with different natures are deposited, which has been discussed elsewhere [20]. Carbon films with different morphologies and structures were deposited [21]. These studies do not reveal that different element atoms form ions. This study confirmed that the atoms of none of the elements ionized.
The study further revealed that an electric current is a photonic current. The bandgap is not due to the conventionally known conduction band. This is due to the interstate electron gap. This study also presents preliminary details of several well-known principles and phenomena with new insights. This study not only revises science but also opens new chapters.

2.0. Experimental details

This work does not contain any specific experimental details. However, the study adds to the general understanding of physical and chemical sciences and various engineering aspects. It helps to write results and present a discussion more insightfully.

This study also helps to explain the results at the micron and bulk levels. This study addresses both scientific and social impacts. In different areas of physical, chemical, environmental, and medical sciences, a reliable discussion is possible by referring to this study.

This study particularly empowers those who like to study atomic behavior, bandgap, physical and chemical phenomena, microscopic analyses, applications related to force and energy, sustainable and green sciences, binding mechanisms of atoms, electric current, and material behavior and structural dynamics. This work is also helpful for studying light-matter interactions and photon-matter interactions. The ambition of the study is to introduce a new era of science by revision. The development of new research methodologies and experimental approaches is needed.

3.0. Models and Discussion
Atoms form one-dimensional arrays of triangularly shaped tiny particles that are elongated under the forces of immersing format [14]. A transitional behavior atom orientated left- and right-sided electrons from the center [18]. Thus, for suitable element atoms, surface forces tilt laterally-oriented electrons adjacently.

Gold particles with high aspect ratios were developed under optimized conditions, as discussed elsewhere [22]. This is due to the tilting electrons of the atoms under a specific orientation. However, the surface force does not largely orient the central electrons of the atoms. Alternatively, the tilting of the electrons is minor.

The electrons of the zeroth or inner rings of the atoms should not address the exertion of surface forces. Therefore, a solid element atom deals with elongation under plastically driven electronic states. In this case, unidirectionally stretched energy knots should not recover. The stretching of energy knots should remain uniform.

In the deformation process of an atom, the non-uniformly stretched energy knots also usually do not recover. In this case, electrons orientate partially adjacent-wise and partially lateral-wise under the uneven reflexes of forces.

In the transition state of an atom, its mass depends on both the force and energy behaviors of the electrons. Therefore, the mass of the same element atom does not remain conserved. The force energy behaviors for the original state solid atom remain conserved. The same can be the case for gaseous atoms. However, they have different scientific insights.

In the modification process of a solid atom, which can be related to the elongation or deformation process, the energy knots that clamp electrons alter the position and alignment.
The lattice of a gaseous atom tightens under suitable conditions. It can also undergo squeezing. Gaseous atoms contract instead of expand under elongation or deformation. When an atom maintains the dynamics of the electron confined, the electron executes interstate dynamics by involving conservative forces [15]. These different atomic behaviors indicate that they do not form ions.

If an atom executes the dynamics of an electron that is partially confined or not confined, that electron engages partial conservative forces or non-conservative forces [19]. In this context, the dynamics of the electrons do not show signs of losing or gaining their atoms.

Figure 1 (a) shows a re-crystallized state of the hypothesized gold atom. This atom should deal with a crystallized (transition) state at an electronically flat solution surface. However, these atoms should undergo uniform elongation upon entering the electronically-decreasing level surface of the solution.

**Figure 1**: A single gold atom of a triangularly shaped tiny particle in the (a) re-crystallized state at the flat solution surface, (b) elongation under immersing forces, (c) further elongation under the impingement of fixed-angle electron streams, and (d) deformation under the impingement of different angled electron streams. (Sketches drawn in estimation)
Figure 1 (b) shows the natural sort of elongation of a gold atom, where the electrons left to the dot (or center) tilt south to the east and the electrons right to the dot tilt south to the west. During elongation, electrons with uniform tilting force their clamped energy knots to stretch unidirectionally. However, the zeroth ring electrons maintain almost the original orientation. Access to surface forces for those electrons remains prohibited. These factors indicate that the solid atoms do not ionize.

A naturally elongated gold atom can further elongate because of the impinging electron streams at a fixed angle (Figure 1c). The electron streams impinge at a fixed angle to the naturally elongated gold atom, further stretching the energy knots.

Thus, that atom undergoes further elongation. When a naturally elongated gold atom does not undergo impingement at a fixed angle, that atom deforms, as shown in Figure 1 (d). The exertion of force remains uneven during the deformation of a solid atom.

The gaseous atoms undergo squeezing behavior instead of elongation or deformation. Gaseous atoms usually deal with tightening energy knots by squeezing rather than stretching. In gaseous atoms, the surface force also controls the orientation of electrons.

In the expansion behavior, the lattice of a solid atom controls the orientation of electrons. Transitional energy changes the energy of an atomic lattice [23]. The expansion can take place throughout the lattice of the solid atom. The orientations of some electrons can reach the same level as in the case of the recovery state of that atom.
An expansion of the solid atom usually occurs between the original and recovery states, which refers to volumetric expansion. Thus, the surface force remains less influential. However, a solid atom expands linearly in the re-crystallization or liquid state.

During contraction, the lattice of a gaseous atom controls the orientation of electrons. Transitional energies of different forms can influence the atomic lattice. The contraction can take place throughout the lattice of the gaseous atom. During contraction, the surface force usually remains less influential. The orientations of some electrons can reach the same level as in the case of the recovery state of that atom.

The orientations of some electrons can also change, as in the case of the liquid state of that atom. Gaseous atoms can uniformly contract within their original state and recovery state. Gaseous atoms can also uniformly contract within the re-crystallized state and liquid state. These atomic behaviors verify that the gaseous atoms do not ionize.

In addition to the filled states, Figure 2 also shows an empty energy knot or unfilled state. An electron does not change its state while undergoing infinitesimal displacement. The transition occurs as per the provision provided by the clamped energy knot. The elongation or deformation of the solid atom indicates that it cannot form an ion. There is no transfer of electrons.

**Figure 2:** (1) filled states and an unfilled state, (2) filled state electrons, and (3) unfilled state (or empty) energy knot
The erosion of solid atoms does not occur because of the loss or gain of electrons. This can be attributed to the extended stretching of the energy knots clamped electrons. On the other hand, the squeezing of gaseous element atoms does not occur because of the loss or gain of electrons. The splitting of the inert gas atom also does not refer to the ionization process.

The eruption of a gaseous atom also occurs not because of the loss or gain of electrons. When atoms lose electrons or gain electrons, their atomic number does not remain the same. However, the mass number is the same in both cases. A negative ion of the gold atom has the same number of electrons as a platinum atom. A positive ion of the gold atom has the same number of electrons as a mercury atom. However, for both negative and positive ions, the mass of the gold atom is the same. Both the ions of the gold atom maintain different atomic numbers. These are not scientifically correct.

This means that atoms do not ionize. From another perspective and when considering earlier atomic structures, for atoms with a valence number of +1, one shell will decrease upon losing the electron, which contradicts their significance.

Atoms of inert behavior split under the field of photonic current because of inertness. A split inert gas atom neither loses the electron nor gains the electron. Kawai et al. [24] highlighted the role of classical van der Waals interactions under the limits of an isolated atomic model. The binding of inert gas atoms can be due to other factors.

The attractive forces that arise from induced dipoles are the van der Waals or dispersion forces [25]. However, this is not the case in studies given elsewhere [10, 14]. In the pulse-based electron photon-solution interface process, photons entering the solution enable the floating of metallic atoms [11].
In a pulse or plasma-based process, the splitting of argon atoms is also due to the photons of current. Hence, inert gas atoms are converted into electron streams. In Figure 3, label (1) shows the argon atom. Label (2) shows the splitting path of the argon atom. When an argon atom splits in an excessive field, electron streams form.

Figure 3 shows the electron streams. In Figure 3, label (3) shows the bottom of the tube dealing with the excessive field, and label (4) shows the electron streams carrying the photons. In Figure 3, label (5) shows a photon traveling without following an electron stream. A photon travels directly to the air medium.

In Figure 3, label (6) shows that a glow of light appears due to the photons. Inert gas atoms behave inertly because they cannot execute electron dynamics. Inert gas atoms also do not undergo transitions.

Figure 3: (1) Argon atom, (2) splitting argon atom under the tube, (3) cathode tube carrying inert gas atoms and an excessive field, (4) electron streams carrying photons, (5) direct entrance of photons to the solution or air-medium, and (6) glow of light

When propagating photons leave splitting inert gas atoms, they enter the solution or air medium, where their characteristics become apparent. There is confinement of the
traveling photon field to the field of the air medium. Therefore, a light appears. Figure 3 shows that a glow appears immediately below the tube. (A photon travels in the air medium. In the interstate electron gap of a material, a photon propagates instead of traveling, which makes better sense.)

The splitting of inert gas atoms allows the way or channel for subsequent traveling photons to enter the air medium. In the visible range, photons emit an orange color. The localization or confinement of forces coming from different sources becomes the cause of lighting behavior.

In silicon solar cells or other similar devices, the dynamics of an electron generate photon characteristics of the current [16]. The transport of photons to fringes is due to the suitable fabrication process of the solar cell. Photons propagate in the interstate electron gaps of atoms to reach the terminals of solar cells. The operation of silicon solar cells for several years contradicts the phenomenon of ion formation. The process of regaining an electron also appears to be irrational. Hence, the photonic current is due to the propagation of photons featuring current.

Due to the supportive behavior of the connected metallic wire, the generated photons propagate nearly at the speed of light through that wire. The propagation of photons occurs through the interstate electron gaps of atoms, forming metallic wires.

The features of the image are resolved within a few nanometers via field emission scanning microscopy and at sub-atomic level resolution via high-resolution transmission microscopy. The photons of current can melt the sample under investigation. Thus, the application of a transmission microscope already has full resolving power. In a high-resolution transmission microscope image, the width of the more elongated atom
reached as close as 0.05 nm [9]. The resolution of that image was due to the transmission of featured photons by the built-in component of that microscope. Therefore, the current is due to propagating photons instead of electrons or charged particles flowing through the metallic wire.

In the arc-based deposition technique, the ignition arc is due to interactions of the high-density population of the featured photons. Therefore, ejected atoms deposit at the surface of the substrate in the form of a coating [20], which again confirms that an electric current is a photonic current. The flow of anions and cations toward the anode and cathode, respectively, during electrolysis is not due to the gain and loss of electrons. Both the energy and force of photons cause the atom to dissociate from the precursor or compound. There is also a need to revise the science of lithium-ion beam technology. In a focused ion beam, sample etching occurs due to the suitable population of featured photons rather than ions [26].

In the case of photoelectric effects or photoemission, the interaction of sunlight with a metal results in the ejection of electrons. Due to the heat available, atoms on a metallic surface execute confined interstate electron dynamics to generate photons. The needle of the ammeter shows deflection due to the current of photons. Hence, this phenomenon is related to the photo-photonic effect. This again validates that an electric current is a photonic current.

These discussions again reiterate that electrons or charged particles cannot flow. Therefore, the electric current is an incomprehensible phenomenon. A photon with current characteristics has a width in the interstate electron gap, as shown in Figure 4.
Figure 4: Unit photon having characteristics of the current (1) width and (2) interstate electron gap.

The ideal wavelength of a photon is the distance between the filled state and the nearby unfilled state of the outer ring on the silicon atom. The distance between the start and the endpoints of a unit photon is the width of the photon. In a structure suitable for the binding of atoms, photons propagate in aligned interstate gaps. The propagating photons in the interstate electron gap transfer their carrying force and energy to another end of the material connected with a suitable device.

Photons of suitable wavelengths propagate in one-way, two-way, or three-way interstate electron gaps. In Figure 5 (a), the propagation of photons is unidirectional. In Figure 5 (b), the propagation of photons is bidirectional. In Figure 5 (c), the propagation of photons is tridirectional. Photons can also propagate tetra-directionally, penta-directionally, and hexa-directionally through four-sided, five-sided, and six-sided interstate electron gaps, respectively. Hence, many studies are required to understand the bandgap related to the propagation of photons in materials with different structures.

Figure 5: Propagation of photons in the interstate electron (or photonic band) gaps of the (a) one-dimensional, (b) two-dimensional, and (c) three-dimensional structures.
In tiny grains of a carbon film, photons propagate in the interstate electron gaps [12]. As discussed elsewhere [16], a unit photon is a subset of an overt photon. Orientation is vital for studying the structure of atoms in all periodic table elements [23]. In addition to entropy and geometry, ongoing research has considered dynamics [27].

Figure 6 shows three-unit photons dealing with multiple interactions. The misaligned electrons do not permit the propagation of photons. Materials with misaligned interstate electron gaps exhibit insulating behavior. Some materials can handle small pitches with aligned electrons, which form interstate electron gaps, where photons can propagate. The short-circuiting can be due to the misaligned interstate electron gap. In a broken photon, the energy and force elements are locally isolated.

**Figure 6:** Unit photons converting into heat energy on interacting with the misaligned electrons

Photons can also convert into heat energy when their propagation is not in line with the aligned interstate electron gap of an electronic or crystalline material. Some details about this phenomenon are given in a separate study [16]. When propagation is in line, photons propagate in the aligned interstate electron gaps without breaking or converting into heat energy. A material with aligned interstate electron gaps was termed a “conductor” in earlier studies.

In a crystalline material structure, photons are propagated without breaking into pieces or bits. By preserving both the natures of energy and force, photons propagate to the output end. In titanium nitride coatings, the deposition of gaseous atoms with solid atoms results in insulating behavior [20].
In structures with different types of atoms, a bandgap for electron flow does not exist. There is also no flow of electrons or charged particles. A photon propagates in the interstate electron gap or photonic bandgap.

In the elongation process of a solid atom, the involved transitional energy uniformly introduces perturbed state electrons. Therefore, the competing forces exerted at the electron level remain even. In the deformation process of a solid atom, the involved transitional energy introduces perturbed state electrons.

In contraction or squeezing behaviors, the forces of gaseous atoms are considered differently. There is a need to research photon-matter interactions or light-matter interactions. Research and development in the energy sector require new methodologies and designs. Conducting research in the energy sector will reduce losses and help individuals build a green environment.

Geometry of cold neutral atoms for quantum engineering by moving optical tweezers in a real-time control system prepared in a study given elsewhere [28]. Regular arrays of individually controlled cold atoms by moving optical tweezers in a real-time control system were prepared [29]. However, the existing study validates that flowing and splitting inert gas atoms can cause photons to glow or light. Inert gas atoms can further clarify the electron-photon phenomena. Studies of inert gas atoms can be more critical in the medical and biological sciences.

All these glitters need not only gold but also titanium nitride [30]. It appears that several elements and compounds can glitter under suitable conditions. In the unit cell of titanium nitride, four titanium atoms maintain a nitrogen atom at the interstitial position. This approach yields almost the same number of states as a gold atom. Therefore, this
is also the reason for the glittering of the titanium nitride coating. The studies given elsewhere [31-50] and the ones not cited here mainly discussed the conduction bandgap, ionization, or electric current.

However, there is a need to discuss the results with new insights and advances. Many science phenomena in the developed processes, devices, and instrumental techniques await their revision.

4.0. Conclusion

The mass of the original state atom remains conserved. The mass does not remain conserved under the transition state of the same atom. Different atomic behaviors do not favor ionization. During the elongation of a solid atom, the exertion of a surface force, consisting of east-west poles, at the electron level occurs. When electrons orient from south to east under an exerted surface force, they are on the left side of the center of an atom. The right-positioned electrons in an atom are oriented south to west under the exerted surface force.

Upon impingement of the electron streams, when not at fixed angles, an elongated atom deforms where energy knots do not stretch unidirectionally. The energy knots clamping electrons twisted in terms of length and shape. However, this is not the case for an already elongated solid atom. These elongated atoms elongate further when the impingement of the electron streams has a fixed angle.

Solid atoms address the expansion behavior, both linearly and volumetrically. A solid can erode during extended elongation. Gaseous atoms can also contract. Gaseous atoms address the tightening of their energy knots. Therefore, they squeeze in their
behavior. During extended squeezing, gaseous atoms can undergo eruption. The flowing inert gas atoms split under an excessive field. When photons leave splitting inert gas atoms, the characteristics of those photons become apparent. A glow of light appears when the force of traveling photons is confined by air.

In a study given elsewhere [16], the interstate electron dynamics of a silicon atom generated photons such as waves. When such photons enter the grid as per the devised procedure of a solar cell, they work for the current. Built-in components of different microscopes release the featured photons to resolve the surface of interest for an image on a computer screen. The propagation of photons occurs through the interstate electron gap or photonic bandgap rather than through the conventionally known conduction bandgap. A “current” refers to the propagation of photons through a metallic wire called a “photonic current” instead of the flow of electrons called an “electric current”, which has been extensively studied.

In a one-way interstate electron gap, the orientation of the electrons of the structured atoms remains one-dimensional. The propagation is unidirectional. In a two-way interstate electron gap, the orientation of the electrons of the structured atoms remains two-dimensional. Therefore, the photons propagate bidirectionally. When the electrons maintain a three-dimensional orientation, the photons propagate tridirectionally. The propagation of photons can occur in additional directions if the passages provided by the interstate electron gaps occur on additional sides. A highly crystalline material introduces photonic behavior. This study enables one to understand microscopic principles, various scientific phenomena, modern physics, chemistry, material science, engineering, and technology.
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In 1996, Mubarak Ali earned a B.Sc. degree in Physics and Mathematics. The University of the Punjab awarded him a degree. His M.Sc. degree in Materials Science in 1998. Bahauddin Zakariya University Multan awarded him a master’s degree with distinction. He completed his thesis at Quaid-i-Azam University Islamabad. He gained a PhD in Mechanical Engineering from the Universiti Teknologi Malaysia under the award of the Malaysian Technical Cooperation Programme (MTCP;2004-07) and a postdoc in advanced surface technologies at Istanbul Technical University under the foreign fellowship of The Scientific and Technological Research Council of Turkey (TÜBITAK, 2010). Dr Mubarak completed another postdoc in nanotechnology at Tamkang University Taipei, 2013-2014, sponsored by the National Science Council, now the Ministry of Science and Technology, Taiwan. He remained working as an Assistant Professor on the tenure track at COMSATS University Islamabad from May 2008 to June 2018, previously known as the COMSATS Institute of Information Technology. His new position is in process. He also worked as an assistant director and deputy director at M/o Science & Technology, Pakistan Council of Renewable Energy Technologies, Islamabad, from January 2000 to May 2008. The Institute for Materials Research at Tohoku University Japan invited Dr. Mubarak to deliver a scientific talk. His scientific research has been a part of many conferences organized by renowned universities in many countries. His core areas of research include materials science, physics, surface and coating technology, carbon-based materials, materials engineering, materials chemistry, physical chemistry, sustainability, energy science, and nanotechnology. He also won a merit scholarship for PhD studies from the Higher Education Commission, Government of Pakistan. However, he did not obtain this opportunity. He earned a diploma (in English) and a certificate (in the Japanese language) in 2000 and 2001, respectively, part-time from the National University of Modern Languages, Islamabad. He is the author of several articles. Please refer to the link https://www.researchgate.net/profile/Mubarak_Ali5 and the link https://scholar.google.com.pk/citations?hl=en&user=UYjvhDwAAAAJ