Atoms in Gaseous and Solid States and their Energy and Force Relationships under Transitional Behaviors

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Abstract

By recalling the conventional studies of the atoms, it is possible to discover the new insights tackling the present and future challenges. Atoms of different elements are formed by the electrons and energy knots. In different elements, atoms are recognized on the basis of numbers of electrons and energy knots. The intercrossing of photons in fixed lengths and numbers constructs the lattice of an atom depending on how many filled and unfilled states in its element are allocated. In intercrossing, the centers of the overt photons remain fixed at a common point. Gaseous atoms keep different schemes of intercrossing overt photons from solid atoms. Except for hydrogen atom, the atoms possess the same valency as specified for them. In the hydrogen atom, two electrons are occupied by the two energy knots. In the helium atom, four electrons are occupied by the four energy knots. A helium atom is related to the zeroth ring in all higher order atoms. In order to validate these aforementioned statements, the concept of considering protons and neutrons is no longer significant. As far as the gaseous atoms are concerned, electrons possess minimum required potential energy. In more than half the length, the electrons remain above the middle of occupied energy knots in the gaseous atoms. Electrons keep on experiencing maximum required levitational force along the north pole. In solid atoms, electrons possess maximum required potential energy. In more than half the length, the electrons remain below the middle of occupied energy knots in the solid atoms. Electrons keep on experiencing maximum required gravitational force along the south pole. Under the established relation of energy and force, atoms undertake the transition states. In the transition, electrons of the atom deal with infinitesimal displacements by remaining within the occupied energy knots. Related orientational force keeps on exerting to the electrons introducing the recovery, neutral, re-crystallization and liquid states for their atoms. In the conversion of gaseous atom into the liquid state, electrons left to the center of atom orientate north to east clockwise, and electrons right to the centre of atom orientate north to west anti-clockwise. In the conversion of solid atom into the liquid state, electrons left to the center of atom orientate south to east anti-clockwise, and electrons right to the center of atom orientate south to west clockwise. These fundamental revolutions shed new light on the development of science and engineering of materials.

Introduction

Understanding the formation of atoms and then relating them with each other enable one to develop the sustainable science of materials. The periodic table shows the positions of atoms in the form of rows and columns based on the characteristics. Such grouping of the atoms mainly depends on the atomic number, mass number, valence number, electronic configuration, atomic radius and electronegativity, etc. The periodic table also provides the information about the valency of atoms in different elements.

The lattice or energy-knot-net of carbon atom remains the same in its different allotropes [1]. Solid atoms elongate at an appropriate level of ground surface [2]. The development of tiny-sized particles has been explained in the light of gold structure [3]. Transitional behavior gold atoms amalgamated at the solution surface to form the monolayer assembly where triangular shape tiny particles were developed [4]. Structural evolutions of atoms when executing confined interstate electron dynamics involve conservative forces as discussed elsewhere [5]. The electron dynamics in the silicon atom convert the heat energy into the photon energy [6]. Such studies reveal that atoms keep electronic structures different than the studied ones.

The mercury belongs to the transition metals group, where it neither shows solid behavior nor gaseous behavior, but it behaves like liquid state. Metals such as cesium, gallium and rubidium remain in solid state at room temperature. However, these metals melt above the room temperature. Such behaviors of the atoms specify that filled and unfilled states of the outer ring play an important role. Further, inert gas atoms do not show any sort of affinity with atoms of other elements. They, even, do not bind to evolve or form or develop the structure. Inert gas atoms split under the excessive propagation of featured photons [2]. To study matter in the form of gaseous and solid atoms, a basic relation between energy and force is also required.

At suitable concentration of gold precursor, a large number of tiny particles in triangular shape got developed [7]. Geometrical shapes of the gold particles were developed under bipolar and unipolar modes of the pulses [8]. In pulse-based solution process, incompatible packing developed the distorted particles and compatible packing developed the anisotropic particles [9]. In the pulse-based process, the processing of gold solution developed the geometrical particles and the processing of silver solution did not develop the geometrical particles [10]. Particles of unprecedented shapes were developed, thereby identifying the specific role of energy and force in their process of developing [11]. These studies deduce different behaviors of atoms.

Atomic structure of carbon allotropes along with their binding has been discussed [1]. Different results of testing and analysis from different regions of the deposited carbon film explain that how difficult it is to reach for an appropriate conclusion [12]. Morphology and structure of particles in depositing carbon films altered under the variation of localized process conditions [13]. Carbon films developed under different grains and particles because of having different chamber pressures [14].

The possibility of assembling colloidal matter into meaningful structure enables atoms and molecules to be candidates for future materials [15]. Understanding the individual dynamics of formation of tiny-sized particles is essential prior to their assembling into useful large-sized particles [16]. Hard coating is due to the varyingly switched energy and forced behaviors of gaseous and solid atoms, where non-conservative energy is involved to engage the non-conservative force, too [17].

Sir Isaac Newton formulated the laws of motion and universal gravitation. The law of universal gravitation involves the mathematical description of gravity. Sir Albert Einstein developed a general theory of relativity along with mass and energy relationship and the principle of relativity was further explained by extending it to the gravitational field, where the concept of anti-gravity (levity) was not incited. The general theory of relativity remained only a model to a large-scale spectrum structure. The different models such as Rutherford’s atomic model and Bohr’s atomic model can be found from the literature defining the atomic structure. In addition, Yukawa’s theory also explains the stability of nucleus (neutron to neutron binding) in an atom.

Gaseous atoms should evolve the structures above the ground surface. Semisolid atoms should evolve the structures just at the ground surface. Solid atoms should evolve the structures below the ground surface. But solid atoms under transitional behaviors are also eligible to develop structures [3, 4, 7-11]. Based on these observations, the structural evolution in atoms has been discussed [5]. Atoms should keep different structures than the ones considering shells, orbits, band gap for flowing electrons, fermi levels, nucleus, etc. The identity of an atom is with respect to the orbital configurations and shells. The nucleus of atom contains protons and neutrons. The atoms are also discussed with quantum physics. But the science of materials raises a fundamental question that how the atoms form. Why do atoms exist in different states? What kind of descriptive mechanism do they require in formation?

The formation of atoms in found elements and their transitional behaviors are discussed in this study. The atomic structure in different elements is elucidated under the new insights. In transitional behaviors of the gaseous and solid atoms, the generalized relationships between energy and force as well as the study of electronic orientation are also being discussed here.

Experimental Details

This work does not include any experimental details, however, all those studies studying the atomic structure, processing and synthesizing of different materials can consider this work. In fact, in all those areas, where the basic study of atoms, the study of morphology and structure, the study of force and energy relation, and the study of light or photon-matter interaction are the topics of interest, the work discussed here is useful.

Results And Discussion

Atomic structure of the carbon atom under different state behaviors has been discussed in another study [1] discussing the construction of its lattice by the fixed lengths and numbers intercrossed photons. Shorter length photons or overt photons are the subsets of the main stream or longer length photons [6]. Atoms do not ionize; in case of solid behavior, they modify to elongate or deform; in case of inert behavior, they split and in case of gaseous behavior, they squeeze [2]. This indicates that the centre of an atom in any element does not involve mass of the electron, so the centre of atom should be only the point of intercrossed overt photons.

In the construction of atomic lattice, photons in the appropriate lengths and numbers intercross by keeping the centers at a common point. The force and energy of intercrossed overt photons remain the actual. In an atom, the intercrossed overt photons shape energy knots for both filled and unfilled states. The overt photons shape filled and unfilled states of energy knots as per the number of filled and unfilled states atoms in different elements possess. Therefore, atoms of different elements can be differentiated on basis of filled and unfilled states. The intercrossed overt photons shape the lattice of an atom related to any element in such a manner that energy knots clamp the positioned electrons or entering electrons in a precise manner.

In the atoms of gaseous, semisolid and solid elements, the schemes of intercrossed overt photons are become different. A state of the electron in atom is related to the filled state and a state of the valency in atom is related to unfilled state. States of filled and unfilled states are studied in the gaseous, semisolid and solid atoms in a similar way. In the atoms of gases, the energy knots shaped by the intercrossed overt photons clamp the electrons from the downward sides. In the atoms of solids, the energy knots shaped by the intercrossed overt photons clamp the electrons from the upward sides. In the atoms of semisolids, the energy knots shaped by the intercrossed overt photons clamp the electrons from the centers or midpoints.

Excluding hydrogen atom, addition of two more electrons in the central ring of any atom is required to shape the zeroth ring. Atoms are already known to have first shell, which has occupied two electrons. However, the first shell is now a zeroth ring, which contains four electrons in the present case. Therefore, an atom requires two more electrons to shape the zeroth ring. The zeroth ring can be termed as nucleus. When no electron is available for the empty energy knot, it is referred to as unfilled state. The number of unfilled states indicates the valency of atom. When the surface force is exerted to the electrons of solid atom at the appropriate level of ground surface, energy knots clamped electrons are stretched along both east-west poles, so that atom is uniformly elongated from the both sides of its centre [2].

Atoms consist on the electrons, which are occupied by the sizeable energy knots. Excluding the inert behavior atoms, atoms of gaseous, semisolid and solid behaviors also possess the unfilled states. The construction of their lattices requires the precise intercrossing of the fixed lengths and numbers photons. A least measured length photon is formed by the two ‘unit photons’, where each unit photon has a shape like Gaussian distribution of turned ends [6].

When two least measured length photons intercross, they shape a knot through intercrossing. A shape of tilted digit ‘eight’ is constructed, which is related to the lattice of hydrogen atom. The intercrossing of two shapes of tilted digit ‘eight’ constructs the lattice of a molecular hydrogen. The number of electrons becomes equal to number of electrons in helium atom. But the helium atom contains four electrons under the originally built-in scheme of energy knots instead of separately intercrossed two shapes of tilted digit ‘eight’. In the helium lattice, two shapes of digit ‘eight’ are constructed. So, four least length photons intercross at the same time to construct the lattice.

Following the zeroth ring, atoms contain either first ring, second ring and so on. Other than zeroth ring, the arrangement of electrons in the available rings of atoms in different elements is in the same manner as studied for them under the earlier studies. Two more electrons need to be added to shape the zeroth ring in atoms of all elements, except hydrogen atom. In addition to two more filled states in the zeroth ring, a net of energy knots in atom of any element follows the same description of filled and unfilled states as mentioned previously, except hydrogen element. In atoms of all elements other than hydrogen element, central four filled state electrons shape the zeroth ring.

Two photons of the least measured length construct a tilted digit ‘eight’ as shown in Figure 1 (a). The electronic configuration of hydrogen atom, hydrogen molecule and helium atom are shown in Figure 1 (b), (c) and (d), respectively. When two photons of the least measured length are intercrossed, they shape a tilted digit ‘eight’, which is the lattice of hydrogen atom as shown in Figure 1 (a). Electrons of the tiniest mass are trapped in the empty spaces of the energy knots. This is shown in Figure 1 (b) in black and green colors. Two hydrogen atoms overlap to form the molecular hydrogen, which is shown in Figure 1 (c). The structure of helium atom is shown in Figure 1 (d).

In atoms of all elements, terminated ends of chains are related to the outer ring. Atoms of certain behavior can keep empty spaces left at the outer ends of their constituted chains. An empty space is exactly the size of energy knot through which an electron can be fixed but without occupying the energy knot. An argon atom might have eight empty spaces in the outer ring in addition to eight filled states as indicated by the arrows in Figure 2. These eight empty spaces are not be related to unfilled states but each of them is in the size or dimension of an energy knot. Under such scenario and to build the chain having one less state at both ends, intercrossed overt photons shape a chain of states having length which is short by a unit photon at both ends. This observation well justifies the model of argon atom as shown in Figure 2.

The structure of lithium atom is shown in Figure 3. The zeroth ring is related to nucleus. The outer ring is related to the first ring, which is also displayed in Figure 3. In Figure 3, lithium atom has a large volume to store energy as arrowed in the regions labelled by 1, 2, 3 and 4. Due to this capacity of storing energy, the structure of lithium is considered quite suitable for energy storage. The lithium atom contains two chains of states as labeled in Figure 3.

Gaseous, semisolid and solid atoms describe their valency by involving the both filled and unfilled states for outer ring. To execute interstate electron dynamics, either non-confined [1] or confined [5], an atom requires a suitable position for its filled and unfilled states in the outer ring. Inert gas atoms neither undertake confined nor non-confined electron dynamics. Further investigations are required to understand the atomic nature in inert behavior elements. A carbon atom remains in gaseous state, semisolid state or solid state depending on the position of electrons and unfilled states in the outer ring [1]; by changing the position of an electron in the nearby suitable unfilled state, a carbon atom gets converted into another state. Therefore, the presence of unfilled states or empty energy knots in the outer rings of atoms is according to their prescribed numbers of electrons and valency. In hydrogen atom, one more electron is required to occupy the second state. The hydrogen atom does not contain the zeroth ring due to the presence of two electrons in total. In this way, helium atom is only related to the zeroth ring having no further ring. Thus, helium atom can be termed as nucleus in all higher order atoms.

The centre of an atom is located at the common point of the intercrossed overt photons. From the mid of occupied energy knots, the electrons keep more than half length to the upward side in gaseous atoms. From the mid of occupied energy knots, the electrons keep more than half length to the downward side in solid atoms.

In the original state, a gaseous atom keeps the ground point in space format by obeying the set energy and force behaviors. When gaseous atom converts into the liquid state, it gains transitional energy (E_T). That atom increases the level of potential energy for the electrons by decreasing their levitational force (F_L). Therefore, electrons of the gaseous atom increase the potential energy to undertake the liquid state. A ground point of the atom reaches near the ground surface. If the liquid state atom gets restored to the original gaseous state, the gained 'E_T' is released. Now, a gaseous atom attains the original state by increasing the 'F_L' of electrons. Here, the potential energy of the electrons is decreased. This is an inversely proportional relationship between 'E_T' and 'F_L', which is symbolically sketched in Figure 4 (a).

In Figure 4 (a), the label (1) indicates conversion of gaseous state atoms into the liquid state under the decreasing 'F_L' exerting at the electron levels where ground points of the atoms are reached near the ground surface, the label (2) indicates the work is done by the gaseous state atoms, the label (3) indicates the conversion of liquid state atoms into the gaseous state under the increasing 'F_L' exerting at the electron levels where ground points of the atoms are reached above the ground surface and the label (4) indicates the work is done on the liquid state atoms.

In the conversion of a gaseous state atom from original state to liquid state, 'E_T' is gained by the atom which is inversely proportional to the exerted 'F_L' at the electron levels, which is shown in equation (1).

$E_T \propto 1/F_L$ or $E_T = L_e \times 1/F_L$ ... (1)

Electrons of the gaseous state atoms deal with the low potential energy. The 'L_e' is related to the levitational constant, which indicates the number of electrons in a gaseous state atom. 'L_e' is different for atoms of different gaseous elements. In equation (1), the 'L_e' is constant for atoms of the same element. The chemical activity of the transitional behavior gaseous atoms introduces different chemical reactivity. Both energy and force behaviors change in the transition state of the gaseous atom.

When an atom of the solid behavior is converted into the liquid state, 'E_T' absorbs positioned electrons in the required orientation. Thus, electrons minimize potential energy dealing with solid atom in negative working. A gravitational force (F_G) exerting along the relevant poles of electrons decreases. Electrons of the atom tilt upward under the infinitesimal displacements to take the liquid state. The potential energy of the electrons also decreases. In the infinitesimal displacements, electrons remain within the occupied energy knots. When the atoms of liquid behavior get restored to the atom of original solid behavior, the equal amount of energy in the sense of gaining manner is involved to attain the original ground point. In this case, that atom now deals with the positive work. Therefore, the solid atoms dealing with the liquid states is in the direct relationship between 'E_T' and 'F_G', which is symbolically sketched in Figure 4 (b).

In Figure 4 (b), the label (1) indicates conversion of solid state atoms into the liquid state under the decreasing 'F_G' exerting at the electron levels where ground points of the atoms are reached near the ground surface, the label (2) indicates the work is done on the solid state atoms, the label (3) indicates the conversion of liquid state atoms into the solid state under the increasing 'F_G' exerting at the electron levels where ground points of the atoms are reached below the ground surface and the label (4) indicates the work is done by the liquid state atoms.

In the conversion of a solid atom from original state to liquid state, 'E_T' absorbed the atom and is directly proportional to the exerting 'F_G' at the electron levels, which is shown in equation (2).

$E_T \alpha F_G$ or $E_T = G_e \times F_G$ … (2)

Electrons of solid atoms deal with high potential energy. The 'G_e' is related to the gravitational constant, which indicates the number of electrons in a solid state atom. 'G_e' is different for atoms of different solid elements. In equation (2), the 'G_e' is constant for atoms of the same element. Chemical activity of transitional behavior solid atoms introduces different chemical reactivity. Energy and force behaviors are changed in each established transitional behavior of the solid atom.

Electrons of the hypothesized gaseous atom depict different transitional behaviors as per their tilting. In Figure 5, only left-positioned electron and right-positioned electron to the centre of gaseous atom are considered. When the gaseous atom keeps its original state, left-positioned electron keeps orientation along the 40°, which is on the left side to the normal line drawn from the center as shown in Figure 5 (a); right-positioned electron also keeps orientation along the 40°, which is on the right side to the normal line drawn from the center. In the recovery state of gaseous atom, left-positioned electron keeps orientation along the 20°, which is on the left side to the normal line drawn from the center as shown in Figure 5 (b); right-positioned electron also keeps orientation along the 20°, which is on the right side to the normal line drawn from the center. In the neutral state of gaseous atom, left-positioned electron keeps orientation along the 5°, which is on the left side to the normal line drawn from the center as shown in Figure 5 (c); right-positioned electron also keeps orientation along the 5°, which is on the right side to the normal line drawn from the center.

In the re-crystallization and liquid states of gaseous atom, left-positioned electrons keep orientations along the 25° and 50°, respectively, which are on the right sides to the normal lines drawn from the centers as shown in Figure 5 (d) and Figure 5 (e), respectively; right-positioned electrons also keep orientations along the 25° and 50°, respectively, but these are on the left sides to the normal lines drawn from the centers. In Figure 5, degrees related to the orientations of electrons are given in approx. values.

Electrons of the hypothesized solid atom depict transitional behaviors as per their tilting. In Figure 6, only left-positioned electron and right-positioned electron to the centre of solid atom are considered. Under the original state of solid atom, left-positioned electron keeps orientation along the 40°, which is on the left side to the normal line drawn from the center as shown in Figure 6 (a); right-positioned electron also keeps orientation along the 40°, which is on the right side to the normal line drawn from the center. Under the recovery state of solid atom, left-positioned electron keeps orientation along the 20°, which is on the left side to the normal line drawn from the center as shown in Figure 6 (b); right-positioned electron also keeps orientation along the 20°, which is on the right side to the normal line drawn from the center. Under the neutral state of solid atom, left-positioned electron keeps orientation along the 5°, which is on the left side to the normal line drawn from the center as displayed in Figure 6 (c); right-positioned electron also keeps orientation along the 5°, which is on the right side to the normal line drawn from the center.

Under the re-crystallization and liquid states of solid atom, left-positioned electrons keep orientations along the 25° and 50°, respectively, which are on the right sides to the normal lines drawn from the centers depicted in Figure 6 (d) and Figure 6 (e), respectively; right-positioned electrons also keep orientations along the 25° and 50°, respectively, which are on the left sides to the normal lines drawn from the centers. In solid atoms, orientations of electrons are taken from their south poles rather than from their north poles. In Figure 6, degree related to the orientations of electrons in each established state of the solid atom is given in approx. value.

Electrons do cross projected lines from the normal lines to the centers when their atoms are in the re-crystallization and liquid states. However, electrons do not cross the projected poles of their atoms. This is shown in Figure 5 for the case of gaseous atom and in Figure 6 for the case of solid atom. The centers of the hypothesized gaseous atom and solid atom are also shown in Figures 5 and 6. Poles or axes of left-positioned electron and right-positioned electron to the center of gaseous atom and solid atom under the neutral state are labeled in Figure 5 and Figure 6, respectively. In both hypothesized gaseous and solid atoms, the origin of reference of left-positioned electron to the center of atom is different from the origin of reference of right-positioned electron to the center of atom.

In the original state gaseous atom and solid atom, both left-positioned and right-positioned electrons to the center of atom keep orientating towards the north from the upward sides and towards the south from the downward sides, respectively. In both gaseous and solid atoms, electrons change the features of occupied energy knots depending on the orientational force and potential energy. In Figures 5 and 6, electrons do not show clamping energy knots and the tilting during transition states is symbolically shown by the curved arrows.

A left-positioned electron and right-positioned electron to the centre of gaseous atom deal with clockwise and anti-clockwise tilting, respectively, in undertaking different transition states. A left-positioned electron and right-positioned electron to the centre of solid atom deal with anti-clockwise and clockwise tilting, respectively, in undertaking different transition states. Transitional behaviors of the atoms are being controlled from the centers. Different orientations of electrons resulted under the correspondence of external environment are also being accommodated from the centers of the atoms. In gaseous and solid atoms, a zone related to the exerting impartial force at the electron level is also discussed elsewhere [5].

In the transition state, either in gaseous atom or in solid atom, electrons deal with infinitesimal displacements by remaining within the occupied energy knots. For this reason, the relation of energy and force in atoms of gaseous and solid states has been discussed above. A gaseous atom or a solid atom undergoes liquid state by varying the potential energy of comprised electrons, where electrons remain clamped by the associated energy knots. In the liquid state of gaseous atom, the infinitesimal displacements of the electrons are towards the downward sides. The lengths of electrons become nearly halfway to the mid of their occupied energy knots. In the liquid state of solid atom, the infinitesimal displacements of the electrons are towards the upward sides. The lengths of electrons become nearly halfway to the mid of their occupied energy knots.

Solid atoms of different groups enlisted in the periodic table undertake different transitions. Different groups of atoms could undertake different energy and force relationship. So, a significant difference in the energy and force relationship can be anticipated. However, within the same group of elements, energy and force relationship of atoms matches to a large extent. A discussion on similar lines can be anticipated for the gaseous atoms enlisted in the periodic table.

The formation of atoms in different elements is in the zones allocated for them. An electron is not discussed in the context of a negative charge. An electron is discussed in the context of a particle. Particles of the smallest sizes make the electronic structure of atom. An electron of any atom is the smallest concrete unit of mass. It deals with forces exerting along the north, south and east-west poles disclosing the behavior of atom.

In the formation of certain natured atoms, some of the energy knots neither work for filled states nor for unfilled states, which remain folded by neighboring chains of energy knots. Folded energy knots in different chains are shown in the atomic structure of titanium [17]. In atoms of some elements, the pieces smaller in size to the electrons can trap in the regions of zeroth rings. Many overt photons are intercrossed under a particular scheme by keeping the centers at a common point, so they shape a required number of chains of states in an atom. In an atom, only four electrons of complete shape and size are eligible to settle in their associated energy knots shaping the zeroth ring. Therefore, in certain behavior atoms, particles of the fractional sizes of an electron may be trapped in the folded or compressed energy knots not working for the filled and unfilled states. The broken pieces of matter though smaller in size to electron can further diversify particle physics and neutrino physics.

When the electrons get jam in the occupied energy knots under the pieces of heat energy, the atoms of transition states cannot deal with the elastically-driven electronic states [18]. On interaction with the electronic tip of atom, a photon reflected under the impact of absorption studying photon-matter interaction [19]. An electronic orientation in the particles determines the nature of amalgamation in solution [20].

To clamp the electrons, the net of energy knots is required. Formation of the tiniest matter and nets of energy knots to shape atoms requires a suitable environment. Formation of atoms locates an environment depending on the characteristics. Nature of the atoms in different groups is different, which are categorized by named classes – gaseous atoms, inert behavior atoms, semisolid atoms and solid atoms. The formation of atoms is according to the conditions that are required to grow in different elements.

Shaping energy knots and their clamping to electrons are one of the most extra-ordinary processes. Atoms of different elements can grow at suitable places or zones. Atoms of the gaseous states can grow above the ground level. Therefore, astronomers, environmentalists, chemists, space scientists and those working in the allied areas may look into the nature of growing those atoms. Atoms of the semisolid states can grow at the ground level, so electrical engineers, earth scientists, physicists, environmentalists and those working in the allied areas may look into the nature of growing those atoms. Atoms of the solid behaviors can grow below the ground surface, so metallurgists, geologists, chemical engineers, chemists, paleontologists and those working in the allied areas may look into the nature of growing those atoms. Some detail about this study is also given in the Supplementary Information.

Conclusion

In all elements, atoms are formed by the energy knots and electrons. Energy knots constructing filled and unfilled states in an atom get shaped by the precise intercrossing of overt photons having fixed lengths and numbers. Lengths and numbers of intercrossed photons are according to the states an element specifies for its atom. In the intercrossing, overt photons keep the centers fixed at a common point where shaping energy knots clamp the electrons. In any element, atomic lattice constructs by the intercrossing of overt photons in specific scheme.

Except hydrogen, atoms of all elements keep their zeroth rings. A zeroth ring is related to the central ring, where four electrons are being occupied by the four energy knots. An atom does not require protons and neutrons to define the nucleus. At the place of orbits or shells, the shaping of rings can be imagined. An atom in any element keeps the zeroth ring and the number of rings required to secure the filled and unfilled states. An atomic structure of helium is identical to the zeroth ring. In hydrogen atom, one more electron is required along with one previously designated. On clamping two electrons by the shape like digit ‘eight’, a hydrogen atom is formed. Joining two hydrogen atoms forms hydrogen molecule but not like the way a helium atom is formed.

In gaseous atoms, electrons keep more than half of their length above the mid of occupied energy knots. In solid atoms, electrons keep more than half of their length below the mid of occupied energy knots. Gaseous and solid atoms when undertake transition states, their electrons deal with infinitesimal displacement by remaining within the occupied energy knots. To undertake liquid states in gaseous atoms, electrons deal with infinitesimal displacements to the downward. To undertake liquid states in solid atoms, electrons deal with infinitesimal displacements to the upward. Gaseous atoms undertake transition states by gaining transitional energy, where levitational force exerting to the electron functions in an inversely proportional relationship. Solid atoms undertake transition states by absorbing the transitional energy, where gravitational force exerting to the electron functions in a directly proportional relationship.

Estimated orientations of the electrons in gaseous atoms when in the original, recovery and neutral states are along the 40°, 20° and 5°, respectively. These orientations are from the right sides to the normal lines drawn from the centers of right-positioned electrons and from the left sides to the normal lines drawn from the centers of left-positioned electrons. Estimated orientations of the electrons in solid atoms when in the original, recovery and neutral states are also along the 40°, 20° and 5°, respectively. But the orientations of electrons are monitored from the south poles. Estimated orientations of the electrons in gaseous atoms when in the re-crystallization and liquid states are along the 25° and 50°. Estimated orientations of the electrons in solid atoms when in the re-crystallization and liquid states are also along the 25° and 50°. But the orientations of electrons are monitored from the south poles.

The transition of an atom is usually out of the environment that an atom takes in the original ground point. An atom undertakes transition under the amount of chemical energy. In transitional behavior gaseous atom, the tilting of left-positioned electrons is clockwise and the tilting of right-positioned electrons is anti-clockwise. The tilting is from the north side. In transitional behavior solid atom, the tilting of left-positioned electrons is anti-clockwise and the tilting of right-positioned electrons is clockwise. The tilting is from the south side. Due to different energy and force behaviors, gaseous and solid atoms deal with different chemical activity, and for their transition states, too.

This study deals with the basic discussion with regards to the formation of atoms and their transitional behaviors. The presented scheme of atoms allows one to develop atoms with different lattices and electrons, so it works for a new diversity of matter. Therefore, there is a vast room to conduct experimental and theoretical research. The presented investigations here may lead to attest sustainable utilization of resources.

Declarations

Acknowledgement:

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Conflicts of interest:

Author declares no conflicts of interest.

Data Availability Statement:

The results and discussion of this work is related to the fundamental nature of science. This manuscript considers the research data where ever it is essential.

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Figures

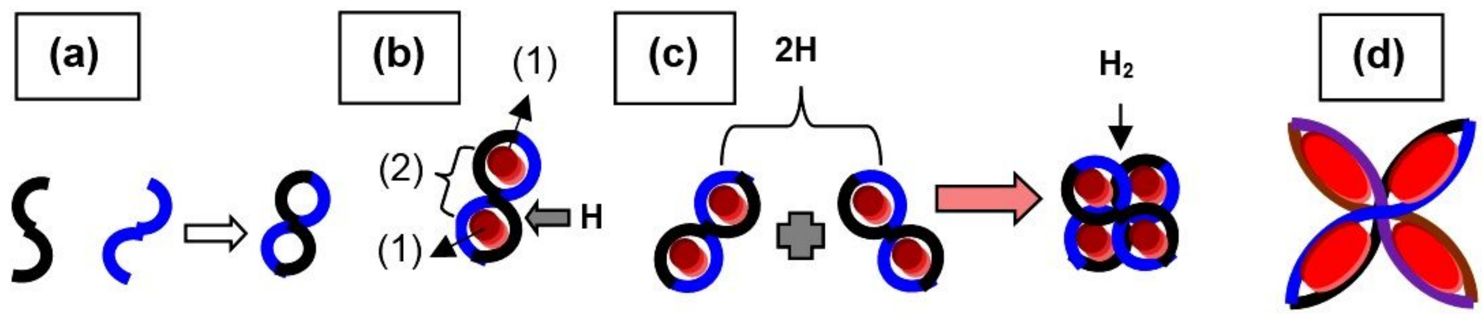

Figure 1

(a) Formation or construction of energy-knot-net in H atom. (b) Structure of H atom; (1) electrons and (2) energy knots. (c) hydro molecule. (d) Structure of helium atom

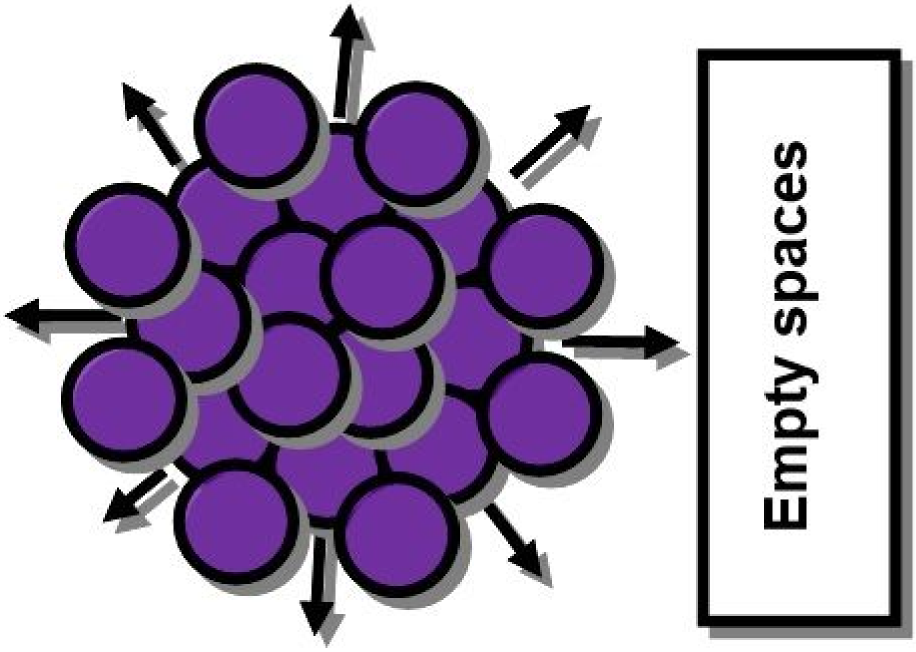

Figure 2

Empty spaces in argon atom indicated by the arrows having length short by a unit photon at both ends of the constituted chains

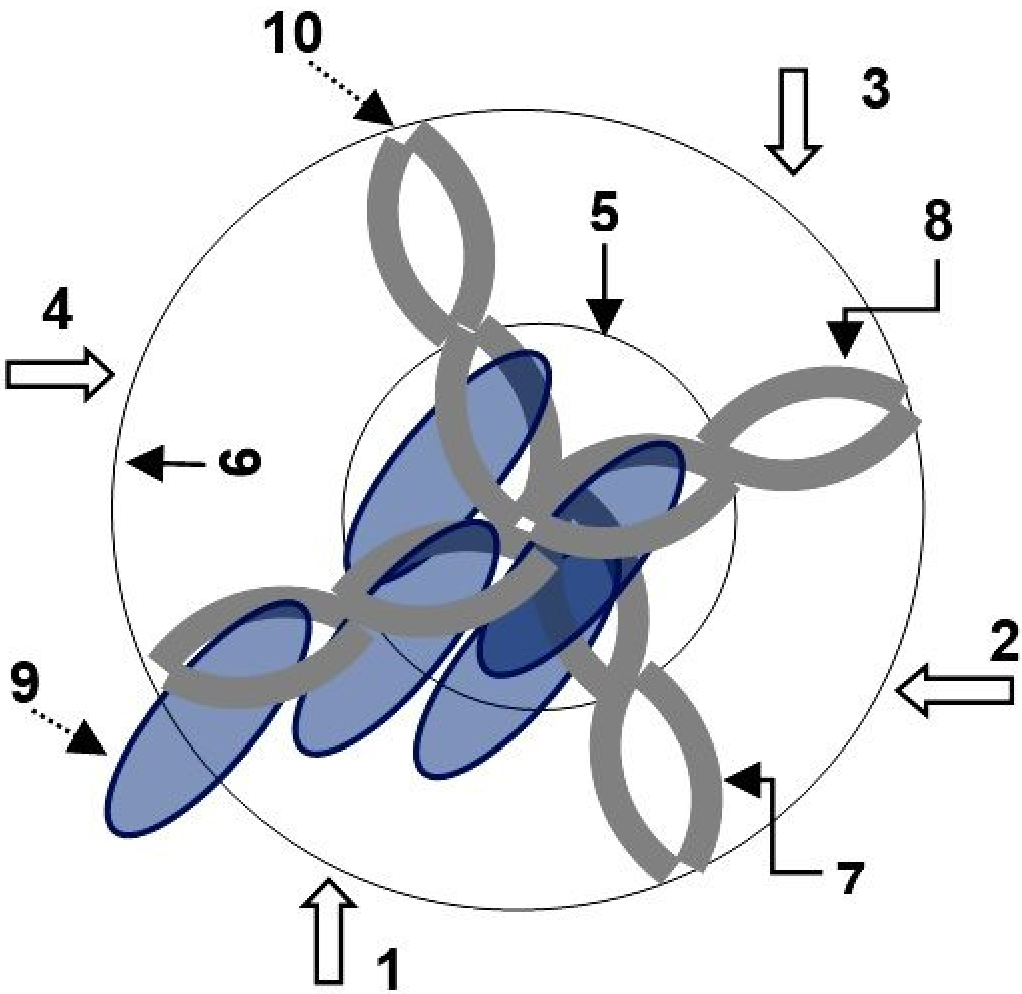

Figure 3

Atomic structure of lithium; 1, 2, 3 & 4 – energy storage regions, 5 – zeroth ring, 6 – outer ring, 7 & 8 – chains of states, 9 – filled state electron and 10 – unfilled state or empty energy knot

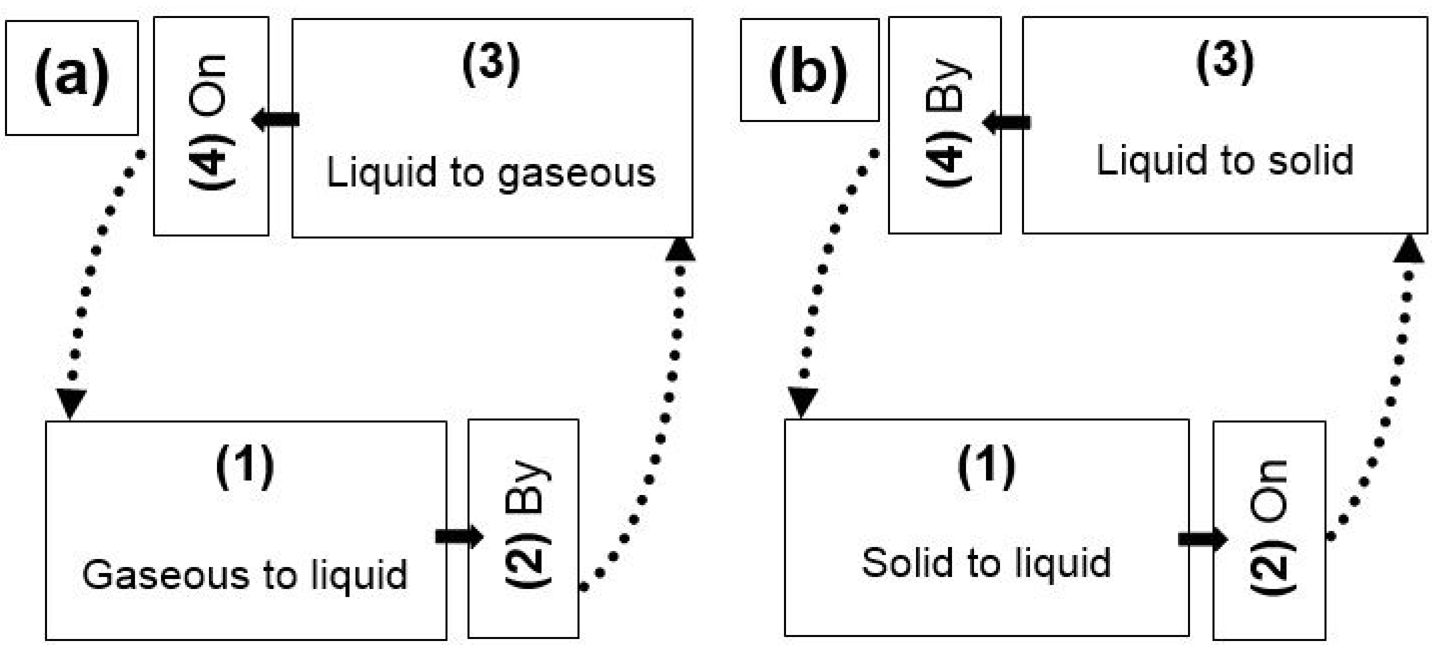

Figure 4

Generalized relationship between energy and force in transitional behaviors atoms when **(a)** gaseous state to liquid state and liquid state to gaseous state and when **(b)** solid state to liquid state and liquid state to solid state

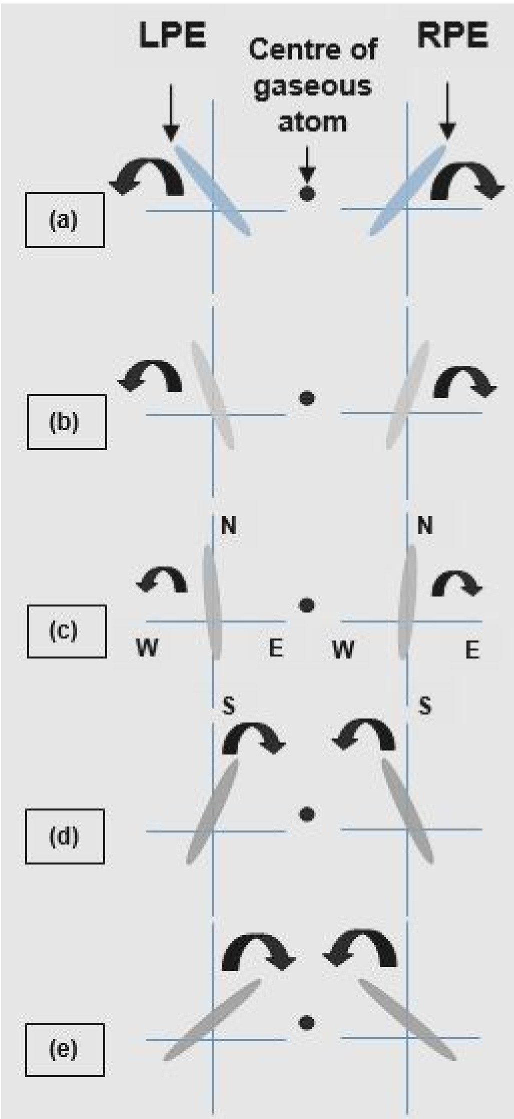

Figure 5

Left-positioned electron (LPE) and right-positioned electron (RPE) to the centre of the hypothesized gaseous atom showing different orientations along the north pole: (a) in original state, along the 40° left to the normal line and along the 40° right to the normal line, respectively, (b) in recovery state, along the 20° left to the normal line and along the 20° right to the normal line, respectively, (c) in neutral state, along the 5° left to the normal line and along the 5° right to the normal line, respectively, (d) in re-crystallization state, along the 25° right to the normal line and along the 25° left to the normal line, respectively, and (e) in liquid state, along the 50° right to the normal line and along 50° left to normal line, respectively

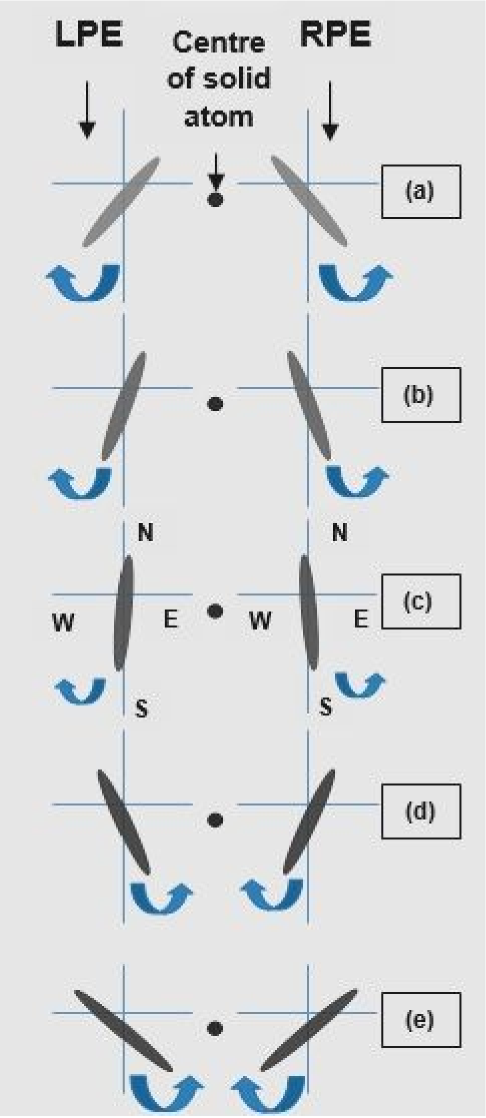

Figure 6

Left-positioned electron (LPE) and right-positioned electron (RPE) to the centre of the hypothesized solid atom showing different orientations along the south pole: (a) in original state, along the 40° left to the normal line and along the 40° right to the normal line, respectively, (b) in recovery state, along the 20° left to the normal line and along the 20° right to the normal line, respectively, (c) in neutral state, along the 5° left to the normal line and along the 5° right to the normal line, respectively, (d) in re-crystallization state, along the 25° right to the normal line and along the 25° left to the normal line, respectively, and (e) in liquid state, along the 50° right to the normal line and along the 50° left to the normal line, respectively

Supplementary Files

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