COMPREHENSIVE APPROACH TO THE LOGICAL CONCEPT OF *SURAT NAU'IYAH* (STRUCTURAL FORMULA) - A REVIEW

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***Abstract*:** The backbone of Unani system is the concept of temperament (*Mizāj*). Equilibrium in *Mizāj* is essential for a healthy body. *Mizāj* of the body depends upon the *Surat-e-Nau'iyah* of that body. Change in *Surat-e-Nau'iyah* leads to change in *Mizāj* of the body. *Surat-e-Nau'iyah* is a logical concept given by ancient scholars which in fact, describes how a single substance or compound come into existence. This concept depicts how the structure of anything has been formed. In ancient times, most of the concepts of Unani system were based on *Mantiq* (Logic) and *Falsafa* (Philosophies). The definitions and concepts in Unani system were originated long time ago. These definitions require re-evaluation with modern perspective. One such topic is *Surat-e-Nau'iyah*. It is one of the important and basic terms in Unani system which requires explanation in the light of modern science. This is an attempt to know more about *Surat-e-Nau'iyah* in terms of Unani classical literature and its explanation in modern scenario as well.

Key words: *Surat -e- Nau'iyah, Mizāj, Hayūlā, Sūra Jismiyya, Unani.*

INTRODUCTION: The Unani system of medicine is also called as Greco-Arab system of medicine. It is developed in Greek. It is a great healing art based upon observation and science, whose theories, philosophies and practice of medicine are most appropriate to the human biological system i.e., the nature (*Ṭabī'at)* and its temperament (*Mizāj).* It is not only the original science of medicine but it is also a rich store house of philosophies of medicine which if understood in its proper perspectives can be proved of immense value to the science in general and medicine in particular. Many theories in ancient period were based on *falsafa* (philosophy). Philosophy deals with the general and fundamental problems related to existence, value, knowledge, reason, mind and language. From the time of Hippocrates, both philosophy and medicine influenced each other. Philosophy has theoretical, methodological, and analytical tools through which one can analyze the concepts of medicine like health and disease.[1] Recent advancements in the basic sciences and technologies are based upon the Greek oriented logics and philosophies, as it is the pillar to develop or invent further innovations in the various fields. One such topic is *Surat-e-Nau'iyah* that was explained by many philosophers in the light of *falsafa* because at that time technologies were not there to exactly as they are now. But now, the science has developed so much, there is a need for re evaluation of *Surat-e-Nau'iyah* with the help of modern science.

WHAT IS A NATURAL BODY (*JISM TABA'I*)? A physical body can be defined as an identifiable collection of matter, which may move as a unit in 3-dimensional space by translation or rotation. It may be constrained by an identifiable boundary. It can be differentiated into length, breadth and height.[2]There may be some change in their quantity but the constituents of body remain the same. The natural body is a substance in which one can posit an extension and another extension crossing it perpendicularly and a third extension crossing both of them perpendicularly. Its having this description is the form by which it becomes a body. The body is not a body in as much as it possesses any three posited extensions. The body is something existing as a body and something fixed, even if the extensions actually existing in it change; for certain actual dimensions (that is, length, breadth, and depth), might be present at one time in a piece of wax or a portion of water as delimited by the extremities (of the wax or water), and then, when it is replaced by another shape, each one of those observed determinate dimensions ceases to be and other extensions and dimensions occur. Yet the body remains in its corporeality, neither corrupting nor being replaced, and the form that we made it have (namely, that it is such that one can posit those extensions in it), remains fixed and does not cease to be[3]. Every physical body is made up of three things:

1. *Hayūlā or Madda*
2. *Sūra jismiyya,*
3. *Surat-e Nau'iyah*

Hayūlā is the Arabic form of Greek word *hyle* which refers to matter. *Hayūlā* is the foremost and most basic substance of a body which is common for all elements. It can accept all sorts of division. It can changes its shape from one form to another but the matter remains the same.[4] Aristotle said that "By *hyle* I mean that which in itself is neither a particular thing nor assigned to any other of the categories by which being is determined".[5] According to Anaxagoras, there was simply a *Hayūlā* at the start, which contained each and every matter in it like gold, silver, air, stone etc. Gradually, all these matter were separated from each other and came into existence.[6] Among all the substances, which are five in classical Islamic philosophy, namely, Intellect, Soul, Body, Form, and Matter (*aql, nafs, jism, surat, maddah*), only the bodily substance is capable of change. The reason for this candidacy is that bodily substance is consist of matter as the carrier of potentiality (*hamil al-quwa*), which in the case of actualizing the primary matter (*hayūlā al-ula*) is the form of three dimensionality (*Sūra jismiyya*), and in the next phases of natural development, all the species in the world.[7]

Sūra jismiyya is the form in which every matter exists. It is the first sketch of any picture. *Sūra jismiyya* depends on *Hayūlā* for its existence[8]. *Jism* can be of two types*: mufrad* and *murakkab*. Some substances are made up of different kinds of elements which have different *Mizāj*. For example a table is made up of wood and nails, both of which have different *Mizāj*. Such a body is called as *jism-e-murakkab*, while some

substance is made up of a single type of element which has same *Mizāj*. They are called as *jism-e-mufrad* or *jism-e-baseet*. Human body is *jism-e-murakkab*.[4]

Surat-e-Nau'iyah refers to the configuration upon which the identity of a matter depends. *Surat-e-Nau'iyah* differentiates a body from another body. All the qualities of a body are due to its *Surat-e-Nau'iyah*. For example the characteristic of water is to flow in its liquid state, to freeze at low temperature, to evaporate at high temperature. All these characteristics of water are due to its *Surat-e- Nau'iyah*.[9] Thus *Surat-e- nau'iyah* is a philosophical term denoting the origin of all the specific properties of matter, and *Surat-e-nau'iyah* is that property of matter which determines its internal structure which is specific for that particular matter. Water, soil, fire and air all are *jism-e-mufrad* (single entities). They all are made up of same matter means they all have dimensions like length, breadth and height. There may be some change in their quantity but they all are made up of matter and all of them possess a body. But still there is a difference in their temperament and their characteristics. This difference is due to the change in their structure or their *Surat-e-Nau'iyah*. In Universe everything tends to move towards its specific centre if there is no obstacle in its path. There is a different centre for every matter, also they have different characteristics. This difference is due to a certain property in matter which is due to its *Surat-e- Nau'iyah* .[4] Tibbi physicians defines the *Surat-e Nau'iyah* as that property of a matter which determines its internal structure which is specific for that particular matter. The chemical properties of anasir (elements) depends upon their *Surat-e- Nau'iyah*. *Surat-e Nau'iyah* of an *unsur*(element) is the atomic structure of that *unsur* which in turn depends on atomic number of that element. *Surat-e- nau'iyah* of a compound depends upon the molecular structure of that compound. Any change in the atomic structure or molecular structure results in change in chemical properties of element or compound respectively.[10]

***SURAT NAU'IYAH* AND *MIZĀJ*:** *Surat-e-nau'iyah* and *Mizāj* of a substance are interconnected with each other. *Mizāj* is derived from the Arabic word "*mazj*" which means mixing of humours.[9] *Mizāj* can be defined as the quality of compound which is produced by interaction and combining of elementary components which combine together to give rise to biochemical processes, physiological functions, morphological expressions and psychic emotions.[11] Fire, water, earth, and air, the four elements from which bodies are compounded, lose their individual qualities in the compound bodies, and equipoise (equity) is what unites them into homogeneous compounds.[12] According to Ibn-e-sina *Surat-e-nau'iyah* is a thing which develop after Mizaj (*imtizāj*-chemical combination). That is when *'Anāṣir* (elements) combine together and after their combination a thing (compound) is formed having the ability of becoming a *naw'*(species) and attaining a new and additional *Surat-e-Nau'iyah* from among *anasir* (elements) which come into combination. This *Surat-e-nau'iyah* is not the name of *kayfiyāt awaliyah* (primary qualities), nor it is the name of that *Mizāj* which develops after combination of *'anasir* (elements), but it is a *kamal* (completeness) which is achieved by unsur according to its ability.[10] *Allama Hakim Kabiruddin* also

enlightens this concept in *Kulliyat-e-Qanoon*. He said that different bodies can accept different forms or surat. They have this capacity due to its *Mizāj*. Change in the *Mizāj* of the body leads to the change in *Surat-e-nau'iyah*.[13] From doctrine of matter and form, it is clear that with the changes from one chemical compound to another in the course of the cyclical phenomena, there is a dropping of the form. Also, the imponderable elements rearrange and blend into new modes at the same time.[12] Elements combine in a fixed proportion to form a compound which has the ability to become a *naw*. Then it attains the new *Surat-e-Nau'iyah*.[14] The atoms in the different elements combine with each other through chemical bonding to form a compound. Early in the nineteenth century Berzelius suggested a theory of bonding termed dualism. Berzelius proposed that atoms are held together by an electrical attraction between oppositely charged species. In 1916, Kossel and Lewis suggested that the interactions between the outer shell (valence) electrons of atoms were responsible for holding the atoms together. Kossel proposed that an electron (or electrons) could be transferred from one atom to another to produce two oppositely charged ions. Attraction of the ions for each other would account for bonding.[15]

ATOMIC STRUCTURE – THE PHENOMENON BEHIND *SURAT-E-NAU'IYA*: According to the present theory, the unit of every matter is atom. The word atom is derived from Greek word '*Atomos*' which means indivisible. Atom is the smallest constituent of every matter that has chemical properties. Every atom has a nucleus and one or more electrons which are bound to nucleus. The nucleus is made up of protons and neutrons.[16] The arrangement of these particles in an atom is responsible for it *Surat-e-Nau'iyah*. Democritus gives the idea that everything is composed of atom which is indivisible and there are empty spaces between atoms. Democritus, Leucippus and Epicurus gave the earliest views on the shape of atom and connectivity of atoms. They proposed that solidness of a material is due to the shape of atoms involved in the formation of its structure. According to Democritus numbers of atoms were infinite and the composition of atoms defines the qualities of an object.[17] Dalton proposed that every chemical element is made up of single, unique type of atom and they cannot be altered by any chemical means but they can form different complex structures. Till 1897, atoms were thought to be the smallest particle of any matter. In 1897 J. J. Thomson discovered the electron in atom. He shows that atoms are divisible with the help of cathode ray experiment. Later in 1909 Ernest Rutherford discovered the nucleus and gives a planetary model of atom in which the compact nucleus of positive charge is surrounded by clouds of electrons.[16] Thus atom consists of electron, proton and neutron. The number of proton is equal to number of electrons. As for the physical world, most, though not all, of the Islamic speculative theologians took it to be a composition of atoms and accidents. Atoms are the minimal units of a wholly simple quantity. As such, atoms have no internal features into which they even could be divided. Although atoms function as the components of the various magnitudes composed of them, such as lines, planes, and solids, they technically cannot be said to have length, width, and depth, for length, width, and depth define bodies whereas atoms are the components out of which bodies are constituted. Since atoms are simple and have no internal features, whatever determinations they do have

are accidents. Accidents are in turn defined as any and every attribute or determination that belongs to atoms and appear in the world, such as colors, tastes, being alive or being ignorant, and the like. Atoms never exist separate from accidents; for in as much as atoms have no determinate features or attributes of their own, and to be wholly indeterminate is simply not to exist, there would be no meaningful sense in which it might be said that atoms exist without accidents. Moreover, every atom has every accident or it's contrary. So, for example, an atom must have either the accident of being black or the accident of being not-black and similarly for taste/no-taste, living/ not-living, knowing/ignorant as well as all the rest of the possible accidents and their contraries.[3]

ILLUSTRATIONS DEPICTING *SURAT-E-NAU'IYA*: Isomerism also supports the concept of *Surat-e-Nau'iyah*. Isomer of a molecule has same atomic number but different arrangement of atoms. Isomers have different chemical structure. There are two forms of isomers:

1) Structural isomers and,
2) Stereoisomers.

Structural isomers differ in the specific attachment of atom and also in functional groups. Structural isomers include position isomers, functional group isomerism, skeletal isomers and tautomers. Example of structural isomers can be shown by propanol and methoxyether. Formula of propanol is C_3H_8O. It has two isomers propan-1-ol and propan-2-ol. Methoxyether also have same formula but have different structure and different properties. Stereoisomers have same number of atoms and the bond structure is also same but they have different geometrical positioning of atoms and functional groups in space for example Glucose and Galactose.[18]

In present day scenario, by *Naw* we refer to the species. Species is the taxonomic rank (Life-Domain-Kingdom-Phylum-Class-Order-Family-Genus-Species). A Genus contains one or more species.[19] Genus is the more general term and species is the more specific term. It is the basic unit of classification. The first part of the definition of every species is its genus and the second part is its difference, which is what completes its definition and what constitutes it, since it provides knowledge of it by means of what is proper to it in its substance[3]. From the time period of Aristotle till 18th century, species were seen as fixed kinds that can be arranged in a hierarchy. Charles Darwin in 19th century gave the idea that species can evolve.[19] Species are different from each other because of their specific *Surat-e-Nau'iyah*. For example plants are different from animals due to their specific *Surat-e-Nau'iyah*.

DISCUSSION AND CONCLUSION: *Surat-e-Nau'iyah* is that property by which all the elements and compounds exhibit distinct qualities (in case of elements) or temperament (in case of compound) and functions (as functions are virtue of quality or temperament). According to the present scenario, it is the atomic structure that is responsible for the different properties of matter, be it elements or compounds as the valency of an atom contributes to its property of dissociating or combining i.e. breakdown or formation of a

substance. Every atom has specific *Surat-e-Nau'iyah* which makes it different from other elements. For example *Surat-e-Nau'iyah* of sodium (Na) is different from chlorine (Cl) as they have different atomic structure and when they combine with each other to form sodium chloride (NaCl) the *Surat-e-Nau'iyah* of these two elements get changed to form new *Surat-e-Nau'iyah* of NaCl. This is the power due to which every *Naw* differ from another. Also, despite many similarities, every being have an individual characters, functions, structure, action, effect, attitude and numerous features. These are the result of *Surat-e-Nau'iyah*. It is responsible for physical as well as chemical appearance of a substance, which means the functional properties as well as physical properties of a substance are virtue of *Surat-e-Nau'iyah*. Therefore, *Surat-e-Nau'iyah* can be regarded as atomic structure (as in elements) or molecular structure (as in compounds).

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