



IMPLEMENTATION OF WATER VALENCE ELECTRONS BY INTERLOCKING PITCH COMBINATION METHODS IN THE PROCESS CREATING MUSICAL WORKS

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Abstract

Water is the source of human life both personally and communally. As a source of life, the benefits of water are very diverse, especially as a source of energy for living things, in humans, water is an important factor because it has a percentage of 70%. The magnitude of the benefits of water, turns out to have a relationship with the chemical formula, namely H₂O, a compound that has perfect bonds. The concept of perfect value in the complementary chemical bonds of water provides a way to implement the value of its valence electrons by working on interlocking pitch combinations in musical compositions. The research method uses Practice Led Research with the aspect of reflection that has a relationship with practice so that the relationship consists of several stages, namely: literature study, sound synthesis, complementary experiment, evaluation and reflection. Research shows that the combination of pitch tones is part of the mathematical function of a musical series, the output of Led Research is in the form of a musical "+26"

Keywords : Implementation, Valence Electrons, Practice Led Research, Combination, Creating

INTRODUCTION

Water and music are wave resources that have the potential to induce human life, water as a source of life is often useful as a therapeutic medium for some sufferers, even cosmologically people believe that water given a prayer or good speech is able to construct crystals that have aesthetic value but vice versa when given a bad word, it deforms, as stated by Emoto [1] [2]. Similar to water, the development of music as therapy is also quite rapid, for example gamelan music is used to reduce mental and physiological illnesses [3]. The development of the similar function of water and music as therapeutic media also raises questions, conceptually interesting problems and actualization in life, namely about water and music models that can be therapeutic.

Science positions water as a source of life for humans. As a source of life, water sufficiency is a phenomenon and procedure carried out by humans both as individuals and communally in maintaining the existence of life [4] [5], but on the other hand, human inability to stabilize water can internalize social, economic and health functions [6] [7] [8] [9]. In the health sector, the phenomenon of the use value of water in life often occurs when a person or communal group requires for daily activities such as consumption of clean water for drinking, washing, cooking and bathing [10], but now the percentage of clean water tends to degrade in quality and quantity caused by habitus and human ego in management.



Drinking activity is literally a therapeutic activity needed by the body when a person is dehydrated, lacks fluids, where when a person is active, the ions in the body will experience a reduction causing effects such as dizzy eyes, dizziness, reduced oxygen supply in the body.

Several studies that utilize the physical and chemical properties of water as therapy in life have been carried out by Shivani Bathia and Shubra Sharaswat [11], who conducted experiments on the combination of Japanese water with cinnamon on the body composition of overweight and obese patients. The study was conducted with 36 subjects divided into three groups, each group consisting of 12 subjects. namely group A using water with cinnamon, group B using water therapy and Group C using warm water. Groups A and B were the test group and group C was the control group. The results showed that group A showed the desired reduction in body weight, WHR, and BMI, but it was not statistically significant in WHR. Similarly, Group B had insignificant results with content for WHR but showed moderate declines across all categories whereas group C as a control group both had either constant or minimal reductions in WHR and statistically insignificant BMI. Research conducted by Maloney provides an idea to position music like water, which aims that music is able to develop in the aspect of use value that can be used daily is able to develop in the realm of daily life and has economic value as well as the nature of water which has the same use value and function in life such as for drinking, cooking, cleaning [12]. Another interesting study revealed by Evans "Fluid Dynamics: Representations of Water in Music" explains that water is an archetype in the history of expression space that has an important position such as in the fields of religion, philosophy and cosmology. From the perspective of the philosophy of belief, water is also referred to as a symbol of creation, purification, purity and change, even the role of water is very important in the art of music, where the concept of metaphor is often described with precision to induce the audience. [13].

The research conducted by Shivani and Subha, Maloney and Evans related to water is an interesting transmission of knowledge, although the three studies are limited to the study area, not yet in the creation of music that is sourced from a material object in the form of water. The phenomenon of why water is very useful for life is related to scientific aspects where based on the perspective of chemistry water is a covalent bond in which a compound that is quite unique because it consists of two hydrogen atoms and oxygen atoms that form H₂O [14]. The valence electrons of hydrogen atoms which have a value of two and oxygen which have a value of six in the chemical structure of water form the number eight, constructing the symbol of stability as described by Danesi regarding symbol representation [15].

The concept of the number eight in music stabilization has also experienced quite a long discourse, especially in determining the value of tone or pitch vibrations, western music which is identical to linearity in semitones because of the similarity of interval values into discourse when the standard 440 Hz notation intervenes at a value of 432 Hz, this change which has been the subject of discussion until now. The concept of the number eight on the Pitch role model of musical instruments with water and its therapeutic value provides an opportunity to make the valence electrons of water a source of creation ideas through experimentation of pitch combinations.

RESEARCH METHOD

The research method used practice led research, the type of developing theory. The research stages are carried out through the practice and process of the creator starting from preparing, synthesizing ideas, determining concepts, implementing and developing theories through practice, to conducting a series of experiments, in order to gain new knowledge. through the results of these practices, as well as realizing the results of research in the form of musical works [16] Practice in practice led research is a planned and conscious

exploration of the knowledge involved in the process of creating works because research is an interrelated part of practice. The data collection in this study used a case study approach [17]. The reason for using this approach is because the reflection stage requires extensive data to solve one by one. Sources of data collected include;

1. Observation of the concept of water compounds using literature studies and visual.
2. Interview

This research consists of five main components:

1. Collection of library data which includes literature studies on the use value of water as a therapy published by researchers in scientific journals or dissertations. review journal about water is source life, water for health, social economics and relation water and music, music and matematics.
2. Interpretation and Eksperimentation



Diagram 1. Eksperiment Sound Combination
[Source: Ketut Sumerjana; Ary Nugraha Wijayanto]

3. Elaboration of intramusical-extramusical elements through sampling and sound synthesis.
4. Preparation and application of tone sound experiments through mathematical combination methods using computer music [18].
5. Evaluation and Reflection Stage: Creating a pattern of musical significance as a construction of thought from the composer's point of view and music as an aesthetic, product from the audience's point of view in a neutral dimension relation [19] [20].

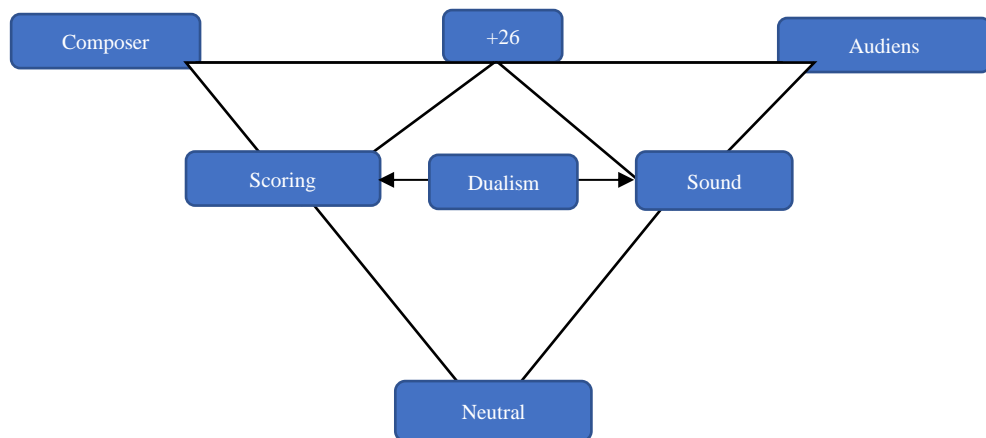
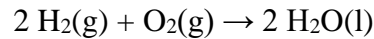
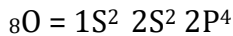
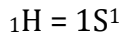


Diagram 2. Evaluation and Reflection Shcematics
[Source : Nattiez (in Evans, 2021) developt by Ketut Sumerjana and Ary Nugraha Wijayanto]

DISCUSSION

Water is a source therapy for human body because consist off therapeutics aspect. Therapeutics value can described in some activity such us drink, that water has use for recycle negative ion. Water as a visual phenomenon have other meaning that instrinsik

element so Idea for composition musical works +26 is a electron valencies water. Sign positive in title because water in human life has many use and function that better values. Sign positive is a second meaning from reflection ion hydrogen has not neutron and can described human body, the body needs ion to defend from threats. Number 26 in title is combination electron valency water, where atom hydrogen has 2 electron and oxygen has 6 electron:



In kovalen structure, atom Hydrogen and Oxygen filling each other build H_2O , a materials that needs in life. Oxygen that deficiency 2 elektron get from atom hydrogen, whereas atom hydrogen get form oxygens. The kovalens structure describe stabilisation, the presence oxygen make hydrogen have a neutral atoms. This concept similiary with music, music can describe combination ion-ion in material instrumen because material instrumen is structure so structure H_2O in composition with matematisal principal can describe

$${}^6_2\text{H}_2\text{O} = \frac{6!}{(6-2)!2!} = \frac{6 \times 5}{2} = 15$$

Number 15 in music can describe quantity 15 tone (2 octave):

1 2 3 4 5 6 7 1 2 3 4 5 6 7 1

If, number 15 are odd number so in etnis musical scale such as While in ethnic musical instrument, example klentangan so get 8 tone colour;

Sol la do re mi sol la do

5 6 1 2 3 5 6 1

But intervals klentangan not similiary with diatonic scale, number 2 in atom hidrogen, number 6 in oxygen is even number. In Phylosopy Dayak Society even number related source of life, while odd number is on the contrary. Related number in music so sound at even knock representased horizontal communication, can described [21].

$$2 = 1 1$$

$$6 = 3 3$$

Contrustion that Formula show relation between communication horizontal (even knock) and vertical (odd Knock), and then developpt with interlocking concept to construct music theraphy.

+26 (H20)

120 Composed : Ketut Sumerjana

The musical score is arranged in five systems, each with a different instrument. The first system (measures 1-4) includes:

- Inst. Kelentangan I:** Treble clef, 4/4 time, playing a steady eighth-note melody.
- Inst. Kelentangan II:** Treble clef, 4/4 time, playing a melody with eighth-note patterns and slurs.
- Gong Ageng:** Bass clef, 4/4 time, playing sustained notes with octave shifts: "3 down octava" and "3 up octava".
- Deep Neural Synthesaizer:** Treble clef, 4/4 time, playing sustained notes with octave shifts: "3 up octava".
- Kendang Belek:** Bass clef, 4/4 time, playing a rhythmic pattern with "2 down octava" shifts.

The second system (measures 5-8) includes:

- Inst. Kelentangan I:** Treble clef, 4/4 time, continuing the eighth-note melody.
- Inst. Kelentangan II:** Treble clef, 4/4 time, playing eighth-note patterns with slurs.
- Inst. Kelentangan III:** Treble clef, 4/4 time, playing eighth-note patterns with slurs.
- Gong Ageng:** Bass clef, 4/4 time, playing sustained notes with octave shifts.
- Deep Neural Synthesaizer:** Treble clef, 4/4 time, playing sustained notes with octave shifts.
- Kendang Belek:** Bass clef, 4/4 time, playing a rhythmic pattern with octave shifts.

2

12

Inst. Kelentangan I

Inst. Kelentangan II

Inst. Kelentangan III

Inst. Kelentangan IV

Gong Ageng

Deep Neural Synthesaizer

Kendang Belek

17

Inst. Kelentangan I

Inst. Kelentangan II

Inst. Kelentangan III

Inst. Kelentangan IV

Gong Ageng

Deep Neural Synthesaizer

Kendang Belek

22 3

Inst. Kelentangan I

Inst. Kelentangan II

Inst. Kelentangan III

Inst. Kelentangan IV

Gong Agung

Deep Neural Synthesaizer

Kendang Belek

27

Inst. Kelentangan I

Inst. Kelentangan II

Inst. Kelentangan III

Inst. Kelentangan IV

Gong Agung

Deep Neural Synthesaizer

Kendang Belek

4

32

Inst. Kelentangan I

Inst. Kelentangan II

Inst. Kelentangan III

Inst. Kelentangan IV

Gong Ageng

Deep Neural Synthesaizer

Kendang Belek

37

Inst. Kelentangan I

Inst. Kelentangan II

Inst. Kelentangan III

Inst. Kelentangan IV

Deep Neural Synthesaizer

Kendang Belek

41 5

Inst. Kelentangan I

Inst. Kelentangan II

Inst. Kelentangan III

Inst. Kelentangan IV

Gong Ageng

Deep Neural Synthesaizer

Kandang Belek

45

Inst. Kelentangan I

Inst. Kelentangan II

Inst. Kelentangan III

Inst. Kelentangan IV

Gong Ageng

Deep Neural Synthesaizer

Kandang Belek

CHART 3. +26 Composition Creating Musical Works
 [Source: Ketut Sumerjana]

CONCLUSION

Water electron valencies are representament dualism balance of life. Relation Electron velancies show the concept stable, complementery. Reflection stable and complementay that describe electron valencies to interpreted with application of combination methods in mathematical operations in the work of +26 produces repetition characteristics of intramusical pitch which form repeat sequences and function as therapy.

REFERENCES

- [1] M. Emoto, *The True Power Water*, Bandung: MQ Publishing, 2006.
- [2] M. Emoto, *The Miracle Of Water*, Jakarta: Gramedia Pustaka Utama, 2007.
- [3] H. Loth, "An Investigation into Relevances of Gamelan Music to Practice of Music Therapy," Anglia Ruskin University, East Of England, 2014.
- [4] R. N. Astuti, "Air Sumber Kehidupan," *Jurnal Studi Islam Ulul Albab*, vol. 9, no. 2, 2008.
- [5] T. Susana, "Air Sebagai Sumber Kehidupan," *Oseana*, vol. XXVIII, no. 3, pp. 17-25, 2003.
- [6] L. A. N. K. Hani Burhanudin, "Nilai Manfaat Ekonomi dalam Pengelolaan Saumber Daya Air Lintas Wilayah Berkelanjutan," *Ethos*, vol. 9, no. 1, 2021.
- [7] D. Novriadhy, "Kualitas Air Bersih dan Potensi dampaknya terhadap Kesehatan Masyarakat di Kabupaten Muara Enim," *Ekologi Kesehatan*, vol. 19, no. 1, pp. 35-44, 2020.
- [8] D. E. Puspitasari, "Dampak Pencemaran Air Terhadap Kesehatan Lingkungan dalam Perspektif Hukum Lingkungan (Studi Kasus Sungai Code di Kelurahan Wirogunan Kecamatan Mergangsan dan Kelurahan Prawirodirjan Kecamatan Gondomanan Yogyakarta)," *Mimbar Hukum*, vol. 21, no. 1, pp. 23-34, 2009.
- [9] Y. Trisna, "Kualitas Air dan Keluhan Kesehatan Masyarakat di Sekitar Pabrik Gula Watoetoelis," *Kesehatan Lingkungan*, vol. 10, no. 2, pp. 220-232, 2018.
- [10] I. E. D. S. I. Zulhilmi, "FAktor yang Berhubungan Tingkat Konsumsi Air Bersih Pada Rumah Tangga di KEcamatan Peudada Kabupaten Bireun," *Biology Education*, vol. 7, no. 2, 2019.
- [11] S. S. Shivani Bhatia, "Effect of Japan Water Theraphy Infused With Cinnamon on Body Wirght, Waist/HIP Ratio and Body Mass Index of overweight and Obese Subject," *Asian Journal of Pharmarecutical and Clinical Research*, vol. 12, no. 9, 2019.
- [12] M. Liam, "Music as Water: The Functions of Music from Utilitarian Perspective," *Avant*, vol. VIII, 2017.
- [13] J. E. Evan, "Fluid Dynamics: Representations of Water in Music," University of Kentucky (UKnowledge), Lexington Kentucky USA, 2021.
- [14] R. H. Petrucci, *Kimia Dasar Prinsip dan Terapan Modern Jilid 2 Edisi 4*, Jakarta: Erlangga, 1987.
- [15] M. Danesi, *Messages, Signs, and Meanings: A Basic Textbook in Semiotics and Communication 3rd*, M. Danesi, Ed., Toronto: Canadian Scholar's Press, 2004.
- [16] L. Candy, "Practice Based Research: A Guide," University Technology Sydney, Sydney, 2006.
- [17] J. W. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approach Third Edition*, California: SAGE Publication, 2009.
- [18] M. Hewitt, *Composition For Using Musician*, United States Of America: Course Technology Creative and Cognitive Studio, 2009.
- [19] R. Scruton, *The Aesthetics of Music*, Oxford: Clarendon Press, 1999.
- [20] W. E. O'Hara, "The Art of Recomposition: Creativity, Aesthetics and Music Theory," Graduates School of Arts and Sciences, Massachusetts, 2017.

- [21] G. Assayang and J. Rodrigues, Mathematics and Music. A Diderot Mathematical Forum, J. R. Gerald Assayang, Ed., New York: Springwen, 2009.