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Wound healing and the quantum nature of viscosity and thermal diffusion of liquids

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Abstract

In wound healing the viscosity of the ointment and its thermal diffusion are important. However, both the viscosity and thermal diffusion of liquids are quantum in nature and require quantum description. It comes from the way the material world was created. The whole material world was created by Black Holes of anti-matter and the NEMF that separated the matter from the anti-matter got imprinted on all material creations. This automatically explains: 1/ why the particles are particles and waves at the same time; 2/ why at very low temperatures (close to the absolute Zero (-273 ^{0} K)) when the particles don't have energy to spin, they behave like waves; and 3/ why the viscosity and thermal diffusion of liquids have quantum nature.

Key words: viscosity quantum nature; thermal diffusion quantum nature; explaining the quantum nature; a material body and NEMF.

1. Introduction

Kostya Trachenko and Vadim Brazhkin in article published in Physics Today, v. 74 (12) 2021 [1] on p. 66 claim that first Landau and Lifshitz [2] drew attention to the fact that the thermodynamic properties and temperature dependences of liquids could not be presented in analytical form applicable to all liquids. Victor Weisskopf (Nobel prize winner for the nuclear chain reaction) in an article published in 1977 [3] underlined that theoretical physicists based on quantum mechanics could predict the existence of gases and solids, but not liquids. Edward Purcell (also Nobel prize winner) in an article published in 1977 [4] underlined that there are no liquids with viscosity lower than water.

2. Explaining the Discrete Levels of Liquid's Viscosity

The viscosity of liquids η is described by the formula

$$\eta = \eta_0 \exp (E/k_B T),$$

where E is the activation energy, k_B is the Bolzman constant, and T is the temperature. The formula describes the decrease of viscosity with the increase of temperature T.

The dynamic properties of liquid flow are described by the kinematic viscosity, which is defined as

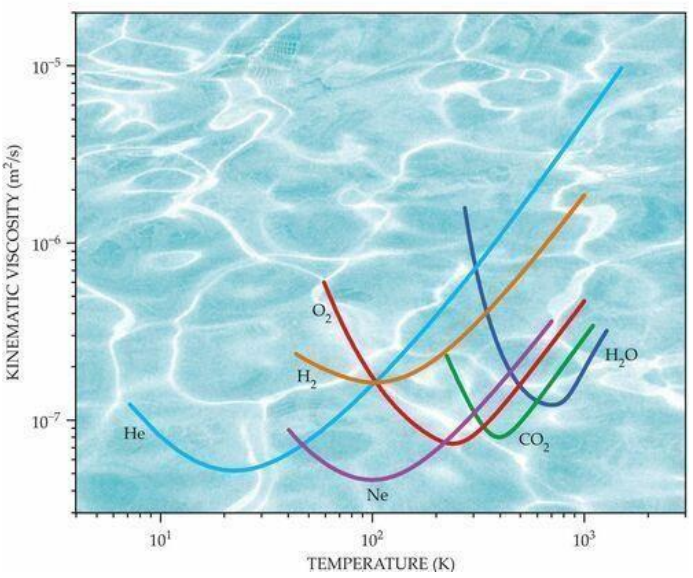
$$\nu = \eta/\rho,$$

where ρ is the liquid density.

Scientists have calculated that the minimum of the liquid density is determined by the formula

$$\nu_{min} = h/8\pi^2\sqrt{m_e}\, m,$$

where m_e is the mass of the electron and m is the mass of the molecules of the liquid under consideration.



Experimental kinematic viscosities of noble and molecular liquids

This is experimental finding, but nobody has ever explained why the minimums of the kinematic viscosity of liquids have discrete values. In this article I intend to do this. In 2019, I published an article [5], in which I explained that everything material is a material body and nonlinear electromagnetic field (NEMF) – it comes from the way the material world was created. The whole material world was created by Black Holes of anti-matter and the NEMF at the border matter - anti-matter got imprinted on all material creations.

The fact that everything material is a material body and NEMF automatically explains why the material particles sometimes behave like particles and sometimes like waves. It also explains why at very low temperature close to the absolute zero (-273^0 K) the particles behave like waves – it is because at these very low temperatures the particles do not have energy to spin and when they don't spin they are waves [6]. The fact that all particles are particles and at the same time waves explains why liquids should behave like waves and the minimum of their kinematic viscosity should be quantized.

3. Explaining the Discrete Levels of Liquid's Thermal Diffusion

The same is the situation with the thermal diffusions, which determine how well the liquids transfer heat [1]. The minimums of their diffusions are also determined by the formula

$$\nu_{min} = h/8\pi^2\sqrt{m_e}\, m,$$

where m_e is the mass of the electron and m is the mass of the molecules of the liquid under consideration. The fact that all particles are particles and at the same time waves explains why liquids, which consist of particles, should have wave-like properties and the minimums of their thermal diffusion would be quantized.

When the predictable Newtonian physics was replaced by the unpredictable Quantum Mechanics, where things were happening only with certain probability, to save themselves the physicists pronounced that Quantum Mechanics should apply only to the micro world. However, if the whole material world is material bodies and NEMF, Quantum Mechanics should apply to the whole material world starting with elementary particles and finishing with astronomy and everything in between (including living beings) [7]. Quantum levels seem to be specific for every NEMF (nonlinear field with vortices and anti-vortices) and since the whole material world is a material body and NEMF, the whole material world would require quantum description [7].

4. Conclusion

If the whole material world is material body and NEMF [5], it is natural to expect quantum behavior of viscosity, thermal diffusion, and other properties of liquids, as well as solids [7] and in the healing of wounds this need to be considered.

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