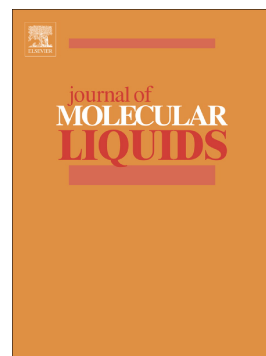


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Is a dangerous blood clot formation a reversible process? Introduction of new characteristic parameter for thermodynamic clot blood characterization: possible molecular mechanisms and pathophysiologic applications

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Abstract

This paper focuses on the rheological characteristics of the blood clot using the non equilibrium thermodynamics. The calculation of the phenomenological and state coefficients allowed to well characterize the clot showing its physical behavior at different frequencies. The goal of the study is to highlight an important inversion of the trend of physical behavior of the clot that tends to show fluidity characteristics for a certain frequency. A new coefficient has therefore been introduced which takes into account the viscoelastic properties of the blood clot. A detailed focus on the rheology of the clot may help to solve or to prevent thrombus genesis in blood vessels.

Keywords Clot rheology, Non-equilibrium thermodynamic, Clot, Ultrasound

Abbreviations ATP Adenosine-5'-triphosphate, DMTA Dynamic Mechanical Thermal Analysis, RCDS Rheological Coagulation Degree Spectrum

Highlights

- Remarks on non equilibrium thermodynamics with internal variables.
- Characterization of blood clot, by means of state and phenomenological coefficients spectrum.
- A new coefficient for the viscoelastic properties of the blood clot was introduced.
- An inversion of the clot physical behaviors trend for a certain frequency was observed.

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