

Fragility of Viscous Liquids: Cause(s) and Consequences

International workshop, Carlsberg Academy, Copenhagen, October 8-10, 2008



Background and purpose of meeting: A continuous challenge in the research field *viscous liquids and the glass transition* is the origin of the non-Arrhenius temperature dependence of the liquid relaxation time. Is there a universal explanation of this intriguing fact? Phenomenological models like the entropy, free volume, and elastic models, link the relaxation time activation energy to macroscopic observables; other models attempt first-principles approaches.

This informal workshop is meant to illuminate various models and viewpoints. The meeting emphasizes discussions of models and correlations between fragility and other observables.

Opening lecturer: Austen Angell.

Deadline for abstract submission: June 10, 2008.

Conference fee: 100 Euro before June 10 (after: 250 Euro).

Maximum number of participants: 70. Participants are registered on a “first-come, first-served basis” upon receipt of the conference fee.

Contact: fragility@ruc.dk

For details of abstract submission, payment, etc: Please consult the *Glass and Time* webpage at <http://glass.ruc.dk>



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Program

Carlsberg Academy, Copenhagen, October 8-10, 2008

Wednesday, October 8

8.00-9.00 REGISTRATION

CHAIR: Aleksander Matić

9.00-9.05 WELCOME by Jeppe Dyre

9.05-9.20 Klaus Bock (DNRF)

The Danish National Research Foundation

9.20-9.50 Austen Angell (Arizona State University)

Opening lecture

9.50-10.00 Discussion

10.00-10.30 Keith Nelson, Jeremy Johnson & Christoph Klieber (MIT)

Coherent MHz and GHz Longitudinal and Shear Acoustic Phonons in Glass-Forming Liquids

10.30-10.40 Discussion

10.40-11.00 COFFEE BREAK.

CHAIR: Ernst Rössler

11.00-11.20 Tina Hecksher (Roskilde University)

Little Evidence for Dynamic Divergences in Ultraviscous Molecular Liquids

11.20-11.30 Discussion

11.30-11.50 Isak Avramov (Bulgarian Academy of Sciences)

Viscosity, entropy and fragility

11.50-12.00 Discussion

12.00-12.20 Nikolaus Petzold (Universität Bayreuth)

The Dynamic Crossover in o-Terphenyl

12.20-12.30 Discussion

12.30-12.50 Albena Nielsen (Roskilde University)

Prevalence of \sqrt{t} Relaxation for the Dielectric α -process in Viscous Organic Liquids

12.50-13.00 Discussion

13.00-14.00 LUNCH.

14.00-16.00 POSTER SESSION.

CHAIR: Andrea Mandanici

16.00-16.20 Ulf Rørbæk Pedersen (Roskilde University)

Long-lived Structural Fluctuations and Crystallization of Binary Mixture

16.20-16.30 Discussion

16.30-16.50 Francois Sausset (Université Pierre et Marie Curie)

*A Fragile Monodisperse Lennard-Jones Liquid on the Hyperbolic plane:
Dynamical Heterogeneities and Topological Defects*

16.50-17.00 Discussion

17.00-17.20 Alistar Ottochian (Pisa University)

*Universal Scaling between Structural Relaxation and Caged Dynamics
in Glass-Forming Liquids, Polymers and Binary Mixtures*

17.20-17.30 Discussion

17.30-17.50 Frederic Affouard (Université Lille)

*Breakdown of the Stokes-Einstein Relation in Lennard-Jones Glass-Forming Mixtures
with different Interaction Potentials*

17.50-18.00 Discussion

18.00-20.00 DINNER (buffet).

CHAIR: Marc Descamps

20.00-20.20 Niels Boye Olsen (Roskilde University)

Ageing of Dielectric and Mechanical Properties

20.20-20.30 Discussion

20.30-20.50 Gregor Diezemann (Universität Mainz)

Memory effects in the Gaussian Trap Model

20.50-21.00 Discussion

Thursday, October 9

CHAIR: Christ Glorieux

- 9.00-9.20 Friedrich Kremer** (Universität Leipzig)
Electrode Polarisation and its Scaling: A Microscopic Model
- 9.20-9.30** Discussion
- 9.30-9.50 Joshua Sangoro** (Universität Leipzig)
Charge Transport and Mass Transport in Ionic Liquids
- 9.50-10.00** Discussion
- 10.00-10.20 Bo Jakobsen** (Roskilde University)
Frequency-Dependent Specific Heat from Thermal Effusion in Spherical Geometry
- 10.20-10.30** Discussion
- 10.30-11.00 COFFEE BREAK.**

CHAIR: Ulrich Buchenau

- 11.00-11.20 Claudio Maggi** (Roskilde University)
Shear-Mechanical and Dielectric Dynamic Heterogeneity in Supercooled Liquids
- 11.20-11.30** Discussion
- 11.30-11.50 Melanie Köhler** (Universität Augsburg)
Dynamics of Structurally and Orientationally Disordered Materials Investigated by Broadband Dielectric Spectroscopy
- 11.50-12.00** Discussion
- 12.00-12.20 Catalin Gainaru** (Universität Dortmund)
Dynamics Slower than the Structural Relaxation in Viscous Liquids
- 12.20-12.30** Discussion
- 12.30-14.30 LUNCH & LEISURE.**

CHAIR: Tullio Scopigno

- 14.30-14.50 Kumar Kunal** (University of Akron)
Influence of Chemical Structure on Fragility in Polymers: A Qualitative Picture
- 14.50-15.00** Discussion
- 15.00-15.20 Daniele Cangialosi** (University of the Basque Country)
Fragility and Thermodynamics in Complex Glass-formers
- 15.20-15.30** Discussion
- 15.30-15.50 Kristine Niss** (Roskilde University)
*Fragility and its (Proposed) Correlation to other Properties
– What Can We Learn from High-Pressure Experiments?*
- 15.50-16.00** Discussion
- 16.00-16.20 Aleksander Matic** (Chalmers University)
Structure and Dynamics in Hydrogen-Bonded Liquids
- 16.20-16.30** Discussion
- 16.30-17.00 COFFEE BREAK.**

CHAIR: Burkhard Geil

- 17.00-17.20 Nicholas P. Bailey** (Roskilde University)
Understanding non-exponentiality and non-Arrhenius Temperature Dependence through Memory Functions
- 17.20-17.30** Discussion
- 17.30-17.50 John C. Mauro** (Corning Incorporated)
On the Relationship Between Fragility and Stretching
- 17.50-18.00** Discussion
- 18.00-18.20 Andreas Heuer** (Universität Münster)
Fragility as Explained from the Landscape Perspective
- 18.20-18.30** Discussion

CONFERENCE DINNER.

PIANO MUSIC played by **Friedrich Kremer.**

Friday, October 10

CHAIR: Morten Eldrup

- 9.00-9.20** **Wei-Hua Wang** (Chinese Academy of Sciences)
The Fragility of Bulk Metallic Glasses
- 9.20-9.30** Discussion
- 9.30-9.50** **Ralf Busch** (Universität des Saarlandes)
On Fragility of Bulk Metallic Glass-Forming Liquids
- 9.50-10.00** Discussion
- 10.00-10.20** **Isabella Gallino** (Universität des Saarlandes)
Kinetic and Thermodynamic Studies of the Fragility of Bulk Metallic Glass-Forming Liquids
- 10.20-10.30** Discussion
- 10.30-11.00** **COFFEE BREAK.**

CHAIR: Søren Torværd

- 11.00-11.20** **Roland Böhmer** (Technische Universität Dortmund)
Strong forever – Supercooled hydration water in connective tissue
- 11.20-11.30** Discussion
- 11.30-11.50** **Thomas B. Schröder** (Roskilde University)
What can Thermal Fluctuations tell us about Fragility?
- 11.50-12.00** Discussion
- 12.00-12.20** **Simone Capaccioli** (University of Pisa)
Single-Parameter Description of the Overall Dynamics of Glass-Forming Liquids under Temperature and Density Variations
- 12.20-12.30** Discussion
- 12.30-13.30** **LUNCH.**

CHAIR: Dorte Lybye

- 13.30-13.50** **David Sidebottom** (Creighton University)
Dynamic Light Scattering in Glass-Forming Ultraphosphate Liquids
- 13.50-14.00** Discussion
- 14.00-14.20** **Yuanzheng Yue** (Aalborg University)
Link between Liquid Fragility and Glass Iso-structure Viscosity
- 14.20-14.30** Discussion
- 14.30-14.50** **Ralf Keding** (Aalborg University)
Fragility of High BaO Containing Glasses
- 14.50-15.00** Discussion
- 15.00-15.20** **Neville Greaves** (Aberystwyth University)
Low Entropy Glasses from Zeolite Amorphisation
- 15.20-15.30** Discussion
- 15.30** **MEETING ENDS.**