



XIV Liquid and Amorphous Metals Conference



Rome 11 - 16 July 2010
"Sapienza" - University of Rome

Synopsis

The 14th International Conference on Liquid and Amorphous Metals (LAM XIV) will be held at the University of Roma "La Sapienza", Italy, July 11-16, 2010. The conference aims to gather the wide community of scientists interested in liquid and amorphous metals and to provide the attendees with an up-to-date survey of progress in this intriguing field of the condensed matter physics.

The first conference of this longstanding cycle of events was held in Brookhaven (USA) as LM-1 in 1966. The next liquid metals conferences were held in Tokyo (1972) and Bristol (1976). The cycle was then renewed including topics on amorphous metals in Grenoble (1980), Los Angeles (1983), Garmisch-Partenkirchen (1986), Kyoto (1989), Wien (1992), Chicago (1995), Dortmund (1998), Yokohama (2001), Metz (2004) and Ekaterinburg (2007).

As in previous editions, the conference is devoted to liquid and amorphous metals, and to those non-metallic systems which are traditionally hosted within the program (semi-conductors, molten salts, quasicrystals, etc.). We are planning also focused sessions to explore new horizons in the field of liquid and amorphous materials, with **special emphasis on those which can be tackled with emerging techniques**. These include the development of advanced radiation sources (synchrotrons, neutrons) for measurements of structural and dynamical properties of liquid, amorphous and colloidal phases; perspectives offered by novel fourth generation soft and hard x-ray sources for metals under extreme and/or highly metastable conditions; ultrafast techniques for studying phase transitions, chemical reactions and non-equilibrium states; ab-initio simulations of metals, alloys and nanosized systems.

The meeting will include single sessions of invited and selected contributing papers as well as dedicated poster sessions.

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On peculiarities of measurements of metal melt viscosity by the method of damped torsional vibrations

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When studying the Co-B and Fe-B alloys the influence of the melt surface state on the measuring kinematic viscosity values obtained by the method of damped torsional vibrations has been investigated. The measurements have been performed in protective helium atmosphere in the cylindrical crucibles made of Al_2O_3 and BeO by the use of the automated installation [1]. Crucibles without a cover and the other one with a cover on the upper melt boundary have been used in the experiments. The first one has one face surface and the other has two face surfaces contacting with the sample.

The measurement results of viscosity are considerably influenced by various experimental conditions (the crucibles being used without and with a cover on the upper melt boundary) and various calculational viscosity schemes for the crucible with one face surface and for the one with two face surfaces contacting with the sample. In case of one face contact surface an oxide film forms on the surface of the melt. The film viscosity is considerably higher and, in fact, it fulfils the function much like the second solid face surface. In this case in the process of torsional vibrations of the crucible additional dissipation of the mechanical energy of the vibrations in the surface layers of the liquid occurs. It results in higher viscosity values. At heating the film dissolves and the viscosity values sharply decrease. If the formation of the film acting as the second face surface and its change in the course of the experiment are not taken into consideration, wrong absolute viscosity values and false (methodical) anomalies in the temperature dependencies may be obtained.

The experiments have been performed by the financial grand of RFBR 08-03000609a.

[1] A. L. Bel'tyukov, V. I. Lad'yanov, *Instruments and Experimental Techniques*, № 2, 155-161, (2008).