Recommended Values of the Viscosity of Molten Iron and Aluminum

The widely different data obtained for the viscosity of molten iron and aluminum will be critically reviewed via an interlaboratory comparison and recommended values will be proposed. Wide ranges of values of viscosity of both molten iron and aluminum are reported in the literature. The most widely used method is some form of oscillating vessel. For the oscillating cup a number of analytical techniques have been used to convert the measurements (logarithmic decrement and time period) to viscosity. The Roscoe equation (1958) was recommended as providing the most accurate data for molten metals. Ferriss et al (2002) have pointed out there is a missing numerator in one of the expansions and a number of workers and standard texts have quoted "$^1/_2$" but expansion shows it to be "$^3/_2$".

In a parallel development, chemical engineers have adopted a set of equations for oscillating cup viscometers by Kestin and Newell, which have been rarely used for molten metals. There are two challenges: 1) Agreement about the equations used to determine the viscosity by the oscillating cup method. At present the modified Roscoe equation by Ferriss and the Kestin and Newell appear to give similar results with one laboratory's data. 2) The widely different data obtained for the viscosity of aluminum and iron need to be critically reviewed and recommended values suggested. This may result in the need for an interlaboratory comparison. The project should lead to a consistent, internationally approved set of values for the viscosity of these two metals, as an exemplar for the field.

References

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For more information, contact the Task Group Chairman W. A. Wakeham <w.a.wakeham@soton.ac.uk>.

www.iupac.org/projects/2003/2003-005-1-100.html

Postgraduate Course in Polymer Science

Since 1996, the Institute of Macromolecular Chemistry of the Academy of Sciences of the Czech Republic in Prague, Czech Republic, has been organizing the annual Postgraduate Course in Polymer Science under the auspices of UNESCO and IUPAC. The course is intended primarily for young graduates from countries with limited facilities for research who have a M.S. or Ph.D. degree in polymer science or a related discipline. The Course lasts 10 months and comprises about 50 hours of lectures in modern polymer science, and a few hours of the basics of chemical English and principles of macromolecular nomenclature according to IUPAC recommendations. Most of the time is devoted to work on topical research projects under the supervision of senior scientists. The participants use all modern experimental facilities of the institute. The results of their work are published in international technical journals and presented at technical meetings.

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www.iupac.org/projects/2002/2002-047-1-400.html

Impact of Transgenic Crops on the Use of Agrochemicals and the Environment

Large-scale cultivation of transgenic (genetically modified) crops started in 1996 and has experienced rapid adoption ever since, amounting to a globally cultivated area of 58.7 million hectares of arable land in 2002. Most of these crops have been modified with new traits that are linked with pest management, such as resistance against damaging insects and tolerance towards application of broad-spectrum herbicides. The focus of this project is to collect data on changes in pesticide use on genetically modified crops.

It has already become evident from a number of studies that genetically modified crops have an impact on pesticide use, both in terms of grower's choice for a specific pesticide as well as in terms of quantities used. Within the project, these data will serve as input for the prediction of the potential environmental and health effects associated with the