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Developments and Applications in Solubility

Solubility is a basic phenomenon underlying most industrial processes. The objective of this project is to produce a book that will bring together recent developments in solubility studies that have a bearing on industrial applications, especially the rigorous work that is underpinned by thermodynamic considerations.

The book will highlight important areas of new research involving theory, techniques, results, modeling, simulation, and industrial applications related to solubility. It will include chapters on super-critical fluids, data banks, "green chemicals," molten salts, liquid-liquid phase equilibria, nanotechnology, industrial solutions including cryogenic solutions, predictions, simulations and molecular modeling, gases in polymers, metallurgical and hydrometallurgical processes, separation processes, and the food, pharmaceutical, and cosmetics industries.

For more information or to comment on this project, contact Task Group Chairman Trevor M. Letcher <trevor@letcher.eclipse.co.uk>.

www.iupac.org/projects/2005/2005-016-1-100.html

Trevor M. Letcher's most recent book, *Chemical Thermodynamics for Industry*, was published in October 2004 by the Royal Society of Chemistry (ISBN 0 85404 591 0). It presents the latest developments in applied thermodynamics and highlights the role of thermodynamics in the chemical industry. To learn more about the book, go to <www.iupac.org/publications/books/author/letcher04.html.>

Glossary of Terms Related to Solubility

This project will define terms related to the phenomenon of solubility, including both experimental and theoretical aspects of gas-liquid, liquid-liquid, and solid-liquid solubility. The terms and definitions will be presented in glossary format and published as IUPAC Recommendations in *Pure and Applied Chemistry*. The glossary will be made available for inclusion in the *IUPAC Compendium of Chemical Terminology* (the Gold Book) and the *Compendium of Analytical Nomenclature* (the Orange Book) as well as in other non-IUPAC publications.

For more information, contact Task Group Chairman David Shaw <ffdgs@uaf.edu>.

www.iupac.org/projects/2005/2005-017-1-500.html

e-Quiz for Promoting Chemical Education

A chemistry quiz titled "Rasayanika" ("chemistry" is "rasayan" in Sanskrit) was conducted in Delhi in 2003 under the auspices of the JK Foundation for Human Development (JKFGD). JKFGD is a part of the JK Organization, one of the most prestigious industrial houses in India. The quiz was an adaptation of the pioneering Australian National Chemistry Quiz developed by Dr. Charles Fogliani under the auspices of the Royal Australian Chemical Institute. Dr. Fogliani has been conducting his quiz in the Australasian region since the 1980s.

Rasayanika was designed to improve awareness of the role that chemistry plays in everyday life in a developing country like India. The highly enthusiastic response from students and teachers in 2003 led to the idea of conducting the quiz outside Delhi in 2004.

Moving Rasayanika to an online format is now desirable; doing so will allow the quiz to reach a wider audience and will professionalize the assessment tools and techniques, allowing Rasayanika to become a catalyst for improving student interest in chemistry. To enable the participation of schools where chemistry is not taught in English, the online version will also be accessible in local languages.

The objective of this project is to design the online version of the exploratory trials conducted in 2003 and 2004. An online quiz will allow students from across India to participate in the 2005–2006 quiz and

will pave the way for its regional extension. Participants in the program will need to take the following consideration into account:

- A question bank will need to be designed and developed, and the questions categorized. Each question should test conceptual ability, application ability, numerical ability, or another specified skill.
- Participants' performance will be analyzed for each question on a five-point scale. The analysis will be made available to all the schools with comments and suggestions for follow-up. It is hoped that this step will motivate many schools to begin a capacity-building program in chemical education.
- The analysis will also be used to validate the items in the question bank. This will permit labeling of questions in the bank by the so-called discrimination index, which indicates the efficacy of an item for assessing student performance.
- To attract large student turnout, Rasayanika 2005 will be held under the IUPAC CCE banner, and all quiz certificates will be signed by the IUPAC president, the CCE chairman, and the chairman of the IUPAC Subcommittee on Chemistry Education for Development.
- To facilitate the participation of students from non-English medium schools, the quiz will also be conducted in local languages. Because India shares some languages with some of its neighbors, the geographical scope of the quiz could be extended, helping to foster regional cooperation in chemical education.
- The program should establish a platform for bringing together specialists (for creating the Question Bank and for validating the items in the bank), school teachers (for providing feedback), industry and government agencies (for instituting awards), and university teachers (for initiating capacity-building programs for schools and teachers).

In summary, the task group envisages the online quiz as a catalyst for enhancing student appreciation of chemical science as a creative and a dynamic field. Although India is the focus of the current project, once an online tool is created, the quiz can be expanded into other geographic regions.

For more information, contact Task Group Chairman K.V. Sane <sitah@bol.net.in>.

www.iupac.org/projects/2005/2005-003-2-050.html

Solubility Data Series: Transition and 12 to 14 Main Group Metals, Lanthanide, Actinide, and Ammonium Halates

A volume of the *Solubility Data Series* will include compilations and critical evaluations for the solubility of transition metal, lanthanide, and actinide halates. The solubility data for the halates of metallic elements in groups 12 to 14 will also be included. Whereas the solubility of ammonium iodate has been compiled and evaluated previously, data on ammonium chlorate (and bromate) have been lacking. Data related to ammonium chlorate are now available and are included in this volume.

Compilations for the solubilities of the title halates in water and organic solvents (such as methanol, ethanol, and dimethyl sulfoxide) and those in aqueous-organic solvent mixtures, aqueous electrolytes, and buffer solutions are included in this volume. The critical evaluations and compilations of the halate solubilities deal only with the simple salts of a type of MX_y (M = metal; X = halate) and do not treat complex compounds such as hexaamminecobalt(III) halates, $[Co(NH_3)_6]X_3$.

The halates of these metals are related to industrial processes. For example, some halates are essential as catalysts, heat stabilizers, and blanching reagents for manufacturing polymer products such as textiles and resins. Some halates are used in pyrotechnic compounds for weather modification and colored smoke generation. The nonlinear halate crystals are important for the construction of optical devices.

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www.iupac.org/projects/2005/2005-033-1-500.html