
Armenia : Scientific News

- PHYSICAL CHEMISTRY: REPORTS OUTLINE PHYSICAL CHEMISTRY STUDY FINDINGS FROM V.A. ATOYAN AND COLLEAGUES

/OCT 7/Science Letter/

According to recent research published in the Russian Journal of Physical Chemistry a, "Methyl heptyl ketone was shown to obey the law of corresponding states as concerns the velocity of sound and adiabatic compressibility."

"An equation for the determination of the inversion temperature depending on the number of carbon and hydrogen atoms in molecules of liquids of this group was obtained. The inversion temperatures of 11 liquid ketones were found and used to calculate their critical temperatures," wrote V.A. Atoyan and colleagues (see also Physical Chemistry).

The researchers concluded: "The paper presents the adiabatic compressibilities of these liquids over the temperature (273-473 K) and pressure ranges (from 0.1 to 160 MPa) studied."

Atoyan and colleagues published their study in Russian Journal of Physical Chemistry a (On the applicability of the law of corresponding states to liquid methyl heptyl ketone. Russian Journal of Physical Chemistry a, 2008;82(9):1605-1609).

For additional information, contact V.A. Atoyan, Armenian State University, Stepanakert, Armenia.

The publisher's contact information for the Russian Journal of Physical Chemistry a is: Maik Nauka, Interperiodica, Springer, 233 Spring St., New York, NY 10013-1578, USA.

- MICROSTRUCTURES: STUDIES FROM YEREVAN STATE UNIVERSITY YIELD NEW DATA ON MICROSTRUCTURES

/OCT 8/Technology News Focus/

"The effect of uniform electric and magnetic fields on binding energy and photoionization cross-section of an off-axis hydrogen-like donor impurity in a QWW, approximated by a cylindrical well of finite depth, is investigated within the framework of variational approach," scientists writing in the journal Superlattices and Microstructures report.

"The dependencies of the binding energy and photoionization cross-section on electric field strength, magnetic field induction, wire radius and impurity position are obtained," wrote V.N. Mughnetsyan and colleagues, Yerevan State University.

The researchers concluded: "The cases when the polarization vector of incident radiation is parallel and perpendicular to the wire axis are both discussed."

Mughnetsyan and colleagues published their study in Superlattices and Microstructures (Binding energy and photoionization cross section of hydrogen-like donor impurity in quantum well-wire in electric and magnetic fields. Superlattices and Microstructures, 2008;44(1):86-95).

Additional information can be obtained by contacting M.G. Barseghyan, Yerevan State University, Dept. of Solid State Physics, Al Manookian 1, Yerevan 0025, Armenia.

The publisher of the journal Superlattices and Microstructures can be contacted at: Academic Press Ltd. Elsevier Science Ltd., 24-28 Oval Rd., London NW1 7DX, England.

- SEMICONDUCTORS: STUDIES FROM E.A. KAFADARYAN ET AL HAVE PROVIDED NEW DATA ON SEMICONDUCTORS

/OCT 14/Science Letter/

"CdSe nanocrystals (NCs) embedded in SiO₂ thin films were prepared using RF-magnetron co-sputtering. The average NC size was estimated to be 18 nm," researchers in Armenia report (see also Semiconductors).

"The dark and photocurrent temporal dependences have been measured as a function of the magnitude of applied voltage (50-150 V). Annealing the samples seems to improve the photoconductivity (similar to $10^{(-12)}$ Ω^{-1}) that increases with the film thickness and slightly changes under the bias voltage. Furthermore, the photovoltage measurements showed that a concentration of CdSe in the range of 27 mol% leads to the generation of a photovoltaic signal up to 5 V at 400 μ W cm^{-2} ," wrote E.A. Kafadaryan and colleagues.

The researchers concluded: "These results demonstrate the potential of silica films with embedded CdSe NCs for photovoltaic applications." Kafadaryan and colleagues published their study in *Semiconductor Science and Technology* (Investigation of photoelectrical properties of CdSe nanocrystals embedded in a SiO₂ matrix. *Semiconductor Science and Technology*, 2008;23(9):95025).

For additional information, contact E.A. Kafadaryan, National Academy Science, Institute Physics Research, Ashtarak 378410 2, Armenia.

Publisher contact information for the journal *Semiconductor Science and Technology* is: IOP Publishing Ltd., Dirac House, Temple Back, Bristol BS1 6BE, England.

- GENERAL CHEMISTRY: RESEARCH RESULTS FROM R.D. KHACHIKYAN AND CO-AUTHORS UPDATE KNOWLEDGE OF GENERAL CHEMISTRY

/OCT 14/Science Letter/

"The example of vinylpyridinium salts to establish for the first time the possibility of nucleophilic addition to the vinyl group in quaternary ammonium salts, which provides evidence against the concept that such reactions involve d orbitals. The nucleophilic addition reaction was accomplished with triphenylphosphine and pyridine," researchers in Yerevan, Armenia report (see also General Chemistry).

"In the latter case, the suggested reaction scheme was confirmed by the observation of the Wittig reaction under the action of carbon dioxide and the Stevens reorganization involving the double bond of the pyridinium ring and migrating 2-phosphonioethyl group. Procedures for preparing the starting vinylpyridinium salts," wrote R.D. Khachikyan and colleagues.

The researchers concluded: "Reaction schemes were suggested."

Khachikyan and colleagues published their study in *Russian Journal of General Chemistry* (Features of the reaction of 2,3-dihalopropanoic acids with pyridines and nucleophilic addition to N-vinylpyridinium salts. *Russian Journal of General Chemistry*, 2008;78(7):1452-1457).

For additional information, contact R.D. Khachikyan, National Academy Science Armenia, Institute Organ Chemical, Ul Zakhariya Kanakertsi 167-A, Yerevan 375091, Armenia.

- SEMICONDUCTORS: STUDIES FROM E.A. KAFADARYAN ET AL HAVE PROVIDED NEW DATA ON SEMICONDUCTORS

/OCT 15/Electronics Newsweekly/

"CdSe nanocrystals (NCs) embedded in SiO₂ thin films were prepared using RF-magnetron co-sputtering. The average NC size was estimated to be 18 nm," researchers in Armenia report.

"The dark and photocurrent temporal dependences have been measured as a function of the magnitude of applied voltage (50-150 V). Annealing the samples seems to improve the photoconductivity (similar to $10^{(-12)}$ Ω^{-1}) that increases with the film thickness and slightly changes under the bias voltage. Furthermore, the photovoltage measurements showed that a concentration of CdSe in the range of 27 mol% leads to the generation of a photovoltaic signal up to 5 V at 400 μ W cm^{-2} ," wrote E.A. Kafadaryan and colleagues.

The researchers concluded: "These results demonstrate the potential of silica films with embedded CdSe NCs for photovoltaic applications." Kafadaryan and colleagues published their study in *Semiconductor Science and Technology* (Investigation of photoelectrical properties of CdSe nanocrystals embedded in a SiO₂ matrix. *Semiconductor Science and Technology*, 2008;23(9):95025). For additional information, contact E.A. Kafadaryan, National Academy Science, Institute Physics Research, Ashtarak 378410 2, Armenia. Publisher contact information for the journal *Semiconductor Science and Technology* is: IOP Publishing Ltd., Dirac House, Temple Back, Bristol BS1 6BE, England.

**- GENERAL CHEMISTRY: RESEARCH RESULTS FROM R.D. KHACHIKYAN AND CO-AUTHORS
UPDATE KNOWLEDGE OF GENERAL CHEMISTRY**

/OCT 17/Chemical & Chemistry Business/

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"In the latter case, the suggested reaction scheme was confirmed by the observation of the Wittig reaction under the action of carbon dioxide and the Stevens reorganization involving the double bond of the pyridinium ring and migrating 2-phosphonioethyl group. Procedures for preparing the starting vinylpyridinium salts," wrote R.D. Khachikyan and colleagues. The researchers concluded: "Reaction schemes were suggested."

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