

BOOK OF ABSTRACTS

**6th Rostocker International Conference on Thermophysical
Properties for Technical Thermodynamics –**

THERMAM 2017

17 – 18 July 2017

University of Rostock

Albert Einstein Str. 2,

D-18059 Rostock, GERMANY

Editors: Prof. Dr. h.c. Egon HASSEL,

Dr. Javid SAFAROV (University of Rostock, GERMANY)

Desingned: © FVTR GmbH, Rostock, GERMANY.

ISBN: 978-3-941554-17-7

2017

Roberto HERNÁNDEZ-GÓMEZ, Dirk TUMA, José J. SEGOVIA, César R. CHAMORRO, Experimental density measurements of two gravimetrically prepared natural gas-type mixtures, one being hydrogen-enriched.....	30
Sebastian HERRMANN, Hans-Joachim KRETZSCHMAR, Eckhard VOGEL, New formulation for the viscosity of normal butane.....	31
Hikmet IBRAGIMOV, Nihad GULIYEV, Jamil ALEKPEROV, Fariz AMIROV, Zenfira IBRAGIMOVA, The investigation of nanocarbon produced pyrolysis liquid products in sunflower oil bleaching process.....	32
Sedef ILK, Necdet SAGLAM, Ezgi EMÜL, Semran SAGLAM, Feza KORKUSUZ, Anti-quorum sensing activity of kaempferol loaded lecithin/chitosan nanoparticles.....	33
Mohamed E. KANDIL, Phase behavior and the change in density and viscosity of higher hydrocarbons after injection with supercritical CO ₂ at pressures to 76 MPa and temperatures to 410 K.....	34
Tobias KOHLER, Karsten MÜLLER, Identifying new sorption systems for thermal energy storage based on thermophysical properties.....	35
Vladimir KURYAKOV, Pier Giorgio De SANCTIS LUCENTINI, Melting, crystallization, and rotational phases transitions of paraffin water emulsions via Static and Dynamic Light Scattering.....	36
Abel MAHARRAMOV, Ulviyya HASANOVA, Mammadali RAMAZANOV, Asli KARACELIK, Ilaha HASANOVA, Alakbar HUSEYNZADA, Alibala ALIYEV, Liaman IMAMGULIYEVA, Gunay IMANZADE, Synthesis of supramolecular ensembles on the basis of nano layers of graphene oxide.....	37
Abel MAHARRAMOV, Ulviyya HASANOVA, Mammadali RAMAZANOV, Zarema GAKHRAMANOVA, Matanat HASANOVA, Gunel ALLAHVERDIYEVA, Narmina GULIYEVA, Nasrin BAKHSHIYEVA, Cavad ABUDOV, Syntesis of zeolite and graphene oxide supported zero valent iron, nickel, cobalt nanoparticles for remediation purposes.....	38
Jonas OBERMEIER, Wolfgang ARLT, Karsten MÜLLER, Energy Storage by decomposition of inorganic solids – thermophysical properties to assess real cycle performance.....	39
Nahit ÖZTOPRAK, Emine Çınar YENI, Binnur Gören KIRAL, Impact behavior of nugget zone in dissimilar friction stir welded AA6061-T6 and AA6061/SiCp composite.....	40
Vitaly ROGANKOV, Valery KALINCHAK, Alexandra SERGEEVA, Marina SHVETS, Oleg ROGANKOV, Global asymmetry of a novel congruent vapor-liquid diagram predicted for fluid fullerenes.....	40
Eugene B. POSTNIKOV, Bernadeta JASIOK, Mirosław CHORAŻEWSKI, Elasticity expansions and prediction of thermodynamic parameters under high pressures.....	41
Heinz RENNER, Ulf HAMMERSCHMIDT, Transient Hot Bridge – a new method to measure thermophysical properties.....	42
Hannes SCHMIDT, Egon HASSEL, Consistency verification of equations of state.....	42
Khagani SULEYMANLI, Abilgani ALIYEV, Javid SAFAROV, Dirk TUMA, Astan SHAHVERDIYEV, Egon HASSEL, Thermophysical properties of 1-alkyl-3-methylimidazolium ionic liquids with PF ₆ anion.....	43
Vyacheslav VERVEYKO, Marina VERVEYKO, Nikita CHEBROV, Andrey VERISOKIN, Darya VERVEYKO Investigation of acoustic and thermophysical properties of liquids by acoustic piezometer method.....	44
Nan ZHAO, Johan JACQUEMIN, Evaluation of the transport properties of ionic liquid-based electrolytes as the function of the temperature and composition.....	45

GLOBAL ASYMMETRY OF A NOVEL CONGRUENT VAPOR-LIQUID DIAGRAM PREDICTED FOR FLUID FULLERENES

Vitaly ROGANKOV^a, Valery KALINCHAK^b, Alexandra SERGEEVA^a, Marina SHVETS^a, Oleg ROGANKOV^a

^a *Department of Physics and Materials, Odessa National Academy of Food Technologies,
1/3 Dvoryanskay st, Odessa, 65082, UKRAINE*

^b *Odessa I. I. Mechnikov National University, 2 Dvoryanskay st, Odessa, 65082, UKRAINE
e-Mail: vrogankov@yandex.ua*

Development of molecular nanotechnologies needs the creation of universal predictive «tools» to study a fluid state diagram in usual molecular scales (from 0.1 to 1 nm) as well as within nanoscales (from 1 to 100 nm) of fullerenes. The fluctuational – thermodynamic (FT-) model proposed earlier by authors includes such main ingredients as: 1) the finite-range fluctuation Lennard-Jones (FLJ-) potential; 2) the global fluid asymmetry (GFA-) principle; 3) the congruent vapor-liquid (CVL-) diagram. The quite restricted experimental or simulated previously information just on a liquid state is necessary to predict CVL-diagram, to determine its stable part corresponding to the standard VLE- diagram and, at least, to estimate consistently the molecular parameters of FLJ-potential for further simulations and corroboration of predictions. The application of FT- methodology to the relevant problem of fullerenes, investigated until now mainly by the Girifalco potential, leads to the following preliminary conclusions. Both parameters of effective diameter and well depth are, most likely strongly overestimated for above standard potential selected for the solid state of fullerenes. As a result, this situation may be the serious distortion factor at the simulation of VLE-diagram for C₆₀, C₇₀. Its striking asymmetry and the much wider range of stability have been revealed by FT-model. The main advantage of developed approach is a possibility to perform the thermodynamically-controllable one - phase simulations on the base of preliminarily predicted CVL- sketch. The further self - consistent procedure provides the testable and reliable prediction of the finalized CVL – diagram.

KEYWORDS: congruent, fullerenes, phase diagram.