

April 2012

SMS instruments are used over a wide range of disciplines. To keep abreast with cutting edge research using dynamic vapor sorption and inverse gas chromatography, SMS regularly reviews the literature. The below papers present recent peer-reviewed articles utilizing gravimetric vapor sorption or inverse gas chromatography.

DVS Articles:

T Hasell, M Schmidtman, CA Stone, MW Smith, and AI Cooper, "**Reversible water uptake by a stable imine-based porous organic cage**" *ChemComm*, 48: 4689-4691 (2012).

JX Song, JF Zhao, Y Ding, GX Chen, XL Sun, D Sun, and QF Li, "**Effect of polyhedral oligomeric silsesquioxane on water sorption and surface property of Bis-GMA/TEGDMA composites**" *Journal of Applied Polymer Science*, 124(4): 3334-33340 (2012).

I Vrublevsky, K Chernayakova, A Bund, A Ispas, and U Schmidt, "**Effect of anodizing voltage on the sorption of water molecules on porous alumina**" *Applied Surface Science*, 248(14): 5394-5398 (2012).

S Renzetti, JA Voogt, L Oliver, and MJB Meinders, "**Water migration mechanisms in amorphous powder material and related agglomeration propensity**" *Journal of Food Engineering*, 110(2): 160-168 (2012).

MA Izquierdo-Gil, VM Barragan, JPG Villalengua, and MP Godino, "**Water uptake and salt transport through Nafion cation-exchange membranes with different thicknesses**" *Chemical Engineering Science*, 72: 1-9 (2012).

K Imamura, R Kagotani, M Nomura, K Kinugawa, and K Nakanishi, "**Heterogeneity of the state and functionality of water molecules sorbed in an amorphous sugar matrix**" *Carbohydrate Research*, 351: 108-113 (2012).

CAS Hill, J Ramsay, B Keating, K Laine, L Rautkari, M Hughes, and B Constant, "**The water vapour sorption properties of thermally modified and densified wood**" *Journal of Materials Science*, 47(7): 3191-3197 (2012).

W Xie, GM Geise, BD Freeman, CH Lee, and JE McGrath, "**Influence of processing history on water and salt transport properties of disulfonated polysulfone random copolymers**" *Polymer*, 53(7): 1571-1592 (2012).

Q Zhao, N Carro, HY Ryu, and J Benziger, "**Sorption and transport of methanol and ethanol in H+-nafion**" *Polymer*, 53(6): 1267-1276 (2012).

RMT van Sleeuwen, SY Zhang, and V Normand, "**Spatial glass transition temperature variations in polymer glass: Application to maltodextrin-water system**" *Biomacromolecules*, 13(3): 787-797 (2012).

C Ihamouchen, H Djidjelli, A Boukerrou, S Krim, M Kaci, and JJ Martinez, "**Effect of surface treatment on the physicochemical and thermal properties of high-density polyethylene/olive husk flour composites**" *Journal of Applied Polymer Science*, 123(3): 1310-1319 (2012).

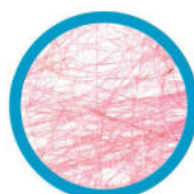
S Jeck, P Scharfer, W Schabel, and M Kind, "**Water sorption in semicrystalline poly(vinyl alcohol) membranes: In situ characterization of solvent-induced structural rearrangements**" *Journal of Membrane Science*, 389: 162-172 (2012).

Z Pavlik, J Zumar, I Medved, and R Cerny, "**Water vapor adsorption in porous building materials: experimental measurement and theoretical analysis**" *Transport in Porous Media*, 91(13): 939-954 (2012).

D Ciolacu, L Pitol, and F Ciolacu, "**Studies concerning the accessibility of different allomorphic forms of cellulose**" *Cellulose*, 19(41): 55-68 (2012).

N Volkova, V Ibrahim, R Hatti-Kaul, and L Wadso, "**Water sorption isotherms of Kraft lignin and its composites**" *Carbohydrate Polymers*, 87(2): 1817-1821 (2012).

CT Johnston, GS Premachandra, T Szabo, J Lok, and RA Schoonheydt, "**Interaction of biological molecules with**



clay minerals: a combined spectroscopic and sorption study of lysozyme on saponite" *Langmuir*, 28(1): 611-619 (2012).

S Alix, L Lebrun, S Marais, E Philippe, A Bouraud, C Baley, and C Morvan, "Pectinase treatments on technical fibres of flax: Effects on water sorption and mechanical properties" *Carbohydrate Polymers*, 87(1): 177-185 (2012).

S Byard, A Abraham, PJT Boulton, RK Harris, and P Hodgkinson, "The multi-technique approach to the study of structural stability and desolvation of two unusual channel hydrate solvates of finasteride" *Journal of Pharmaceutical Sciences*, 101(1): 176-186 (2012).

W Sonderegger and P Niemz, "Thermal and moisture flux in soft fibreboards" *European Journal of Wood and Wood Science*, 71(1-3): 25-35 (2012).

TD Khokhlova, NK Shonija, and OB Popovicheva, "Kinetics of saturated water vapor sorption on soot particles" *Russian Journal of Physical Chemistry A*, 86(1): 120-126 (2012).

T Ueto, N Takata, N Muroyama, A Nedu, A Sasaki, S Tanida, and K Terada, "Polymorphs and hydrate of Furosemide-Nicotinamide 1:1 cocrystal" *Crystal Growth & Design*, 12(1): 485-494 (2012).

FR Kang, FG Vogt, J Brum, R Forcino, RCB Copley, G Williams, and R Carlton, "Effect of particle size and morphology on the dehydration mechanism of a non-stoichiometric hydrate" *Crystal Growth & Design*, 12(1): 60-74 (2012).

CAS Hill, BA Keating, Z Jalaludin, and E Mahrtdt, "A rheological description of the water vapour sorption kinetics behavior of wood invoking a model using a canonical assembly of Kelvin-Voigt elements and a possible link with sorption hysteresis" *Holzforschung*, 66(1): 35-47 (2012).

MR Hall, SCE Tsang, SP Casey, MA Khan, and H Yang, "Synthesis, characterization and hygrothermal behavior of mesoporous silica high-performance desiccants for relative humidity buffering in closed environments" *Acta Materialia*, 60(1): 89-101 (2012).

D Khamar, IJ Bradshaw, GA Hutcheon, and L Seton, "Solid State Transformations Mediated by a Kinetically Stable Form" *Crystal Growth & Design*, 12(1): 109-118 (2012).

IGC Articles:

A Marciniak and M Wlazlo, "Activity coefficients at infinite dilution and physicochemical properties for organic solutes and water in the ionic liquid 1-(2-methoxyethyl)-1-methylpiperidinium bis(trifluoromethylsulfonyl)-amide" *Journal of Chemical Thermodynamics*, 49: 137-145 (2012).

LN Jia, B Li, BL Shi, HJ Zhang, YQ Lan, X Zhang, Y Wang, and LL Wang, "Quantitative analysis of interfacial tension effect on the impact strength of organic flame retardants and acrylonitrile-butadiene-styrene blends" *Journal of Applied Polymer Science*, 124(3): 1815-1823 (2012).

JC Huang "Linear solvation energy relationship and evaluation of mutual miscibility of polymers using IGC data" *Journal of Applied Polymer Science*, 124(2): 1295-1301 (2012).

MK Al-Ghait, AS Al-Arifi, NM Al Andis, ZA AlOthman, and T Aouak, "Miscibility enhancement on the PVC/PMMA blend and characterization by IGC: The corrected polymer-polymer interaction parameters from the probes dependency" *Journal of Applied Polymer Science*, 124(2): 1464-1475 (2012).

M Maciejewska, "Characterization of macroporous 1-vinyl-2-pyrrolidone copolymers obtained by suspension polymerization" *Journal of Applied Polymer Science*, 124(1): 568-575 (2012).

A Blahut, V Dohnal, and P Vrbka, "Interactions of VOC's with the ionic liquid 1-ethyl-3-methylimidazolium tetracyanoborate RID A-1645-2011" *Journal of Chemical Thermodynamics*, 47: 100-108 (2012).

N Cordeiro, C Mendoca, LA Pothan, and A Varma "Monitoring surface properties evolution of thermochemically modified cellulose nanofibers from banana pseudo-stem" *Carbohydrate Polymers*, 88(1): 125-131 (2012).

SK Papadopoulou and C Panayiotou, "Thermodynamic characterization of poly(1,1,1,3,3,3-hexafluoroisopropyl methacrylate) by IGC" *Journal of Chromatography A*, 1229: 230-236 (2012).

E Schuhfried, E Aprea, L Cappellin, C Soukoulis, R Viola, TD Mark, F Gasperi, and F Biasioli, "Desorption kinetics with PTR-MS: Isothermal differential desorption kinetics from a heterogeneous inlet surface at ambient pressure and a

new concept for compound identification" *International Journal of Mass Spectrometry*, 314: 33-41 (2012).

BH Zhong, and ZY Al-Saigh, "**Characterization of biodegradable polymers by IGC. III Blends of amylopectin and poly(L-lactide)**" *Journal of Applied Polymer Science*, 123(5): 2616-2627 (2012).

P Wu, H Gao, JS Sun, TT Ma, YZ Liu, and F Wang, "**Biosorptive dehydration of tert-butyl alcohol by using starch-based adsorbent: Characterization and thermodynamics**" *Bioresource Technology*, 107: 437-4473 (2012).

F Mutelet, JC Moise, and A Skrzypczak, "**Evaluation of the performance of trigeminal tricationic ionic liquids for separation problems**" *Journal of Chemical and Engineering Data*, 57(3): 918-927 (2012).

K Nikooyeh, SR Bagheri, and JM Shaw, "**Interactions between Athabasca pentane asphaltenes and n-alkanes at low concentrations**" *Energy & Fuels*, 26(3): 1756-1766 (2012).

N Cordeiro, M Ornelas, A Ashori, and H Norouzi, "**Investigation on the surface properties of chemically modified natural fibers using IGC**" *Carbohydrate Polymers*, 87(4): 2367-2375 (2012).

HY Liu, Y Li, WE Krause, OJ Rojas, and MA Pasquinelli, "**The soft-confined method for creating molecular models of amorphous polymer surfaces**" *Journal of Physical Chemistry B*, 116(5): 1570-1578 (2012).

G Keledi, J Hari, and B Pukanszky, "**Polymer nanocomposites: structure, interaction and functionality**" *Nanoscale*, 4(6): 1919-1938 (2012).

VY Guskov, FK Kudasheva, EV Mukhachev, and ER Valinurova, "**Sorption properties of low-temperature carbonizate of DOWEX L-285 porous polymer**" *Protection of Metals and Physical Chemistry of Surfaces*, 48(1): 116-119 (2012).

F Sesigur, D Sakar, O Yasa-Sahin, H Ocak, O Cankurtaran, B Bilgin-Eran, and F Karaman, "**Thermodynamic and surface characterization of (S)-5-dodecycloxy-2-[[[4-(2-methylbutoxy)phenyl]imino]methyl]phenol thermotropic liquid crystal by IGC**" *Liquid Crystals*, 39(1): 87-97 (2012).

MH Shariare, FJJ Leusen, M de Matas, P York, and J Anwar, "**Prediction of the mechanical behavior of crystalline solids**" *Pharmaceutical Research*, 29(1): 319-331 (2012).

New SMS Publications:

Application Notes

"An Overview of Dynamic and Gravimetric Sorption Vacuum System" *DVS Application Note 50.*

"Gas Capture and Vapour Separation by Microporous Materials" *DVS Application Note 51.*

"Measurement of Moisture Uptake Capacity in Human Hair Using Dynamic Vapour Sorption Technique" *DVS Application Note 55.*

"Measuring TEWL or Moisture Flux Across Artificial Skin" *DVS Application Note 56.*

"Isotherm Measurements for BET Surface Area Calculations using Inverse Gas" *IGC Application Note 225.*

Case Studies

"Effect of Processing Route on the Physical Properties of Amorphous Indomethacin" *SMS Case Study 614.*

"In-situ Monitoring of a Moisture-Induced Polymorphic Transition using Raman Spectroscopy and Gravimetric Vapour Sorption" *SMS Case Study 615.*

"Determination of Surface Properties of Human Hair by Inverse Gas Chromatography and Dynamic Vapour Sorption" *SMS Case Study 616.*

Upcoming Conferences:

UK and Ireland Controlled Release Symposium: University of Aston, UK; 1-2 May 2012; Exhibitor.

PhandTA-12: Graz, Austria; 05-09 May 2012; Exhibitor.

Oral Presentation: "Energetic Heterogeneity of Pharmaceutical Materials"

Workshop: "BET Surface Area Determination of Hydrated Pharmaceutical Materials"

Respiratory Drug Delivery: Phoenix, AZ, USA; 13-17 May 2012; Exhibitor.

Society of Cosmetic Chemists: Raritan, NJ, USA; 15-16 May 2012; Exhibitor.

SAMPE: Baltimore, MD, USA; 21-24 May 2012; Exhibitor, Booth 1444.

Oral Presentation: "Surface Energy Heterogeneity of Carbon Fibers – Effects of Heat Treatment and Sizing"

EuroFoodWater Conference: Helsinki, Finland; 3-5 June 2012; Exhibitor.

American Filtration and Separation Society: Boca Raton, FL, USA; 4-7 June 2012; Exhibitor.

Achema: Frankfurt, Germany; 18-22 June 2012; Exhibitor.

International Symposium on Spray Dried Dairy Products: Saint-Malo, France; 19-21 June 2012; Exhibitor and Presenter.

Oral Presentation: "Determination of moisture-induced phase transitions of spray dried lactose using vapour sorption techniques"

Poster Presentation: "Quantification of surface amorphous content using dispersive surface energy"

International Symposium on Spray Dried Dairy Products: Saint-Malo, France; 19-21 June 2012; Exhibitor and Presenter.

APS PharmSci 2012: East Midlands Conference Centre, Nottingham, UK; 12-14 September 2012; Exhibitor.

SMS Training:

SMSNA Office: 11 April 2012 (DVS) and 12 April 2012 (IGC/SEA); Email Science@smsna.com for details.

SMSUK Office: 04 September 2012 (DVS); 05 September 2012 (IGC/SEA); Email Science@smsuk.co.uk for details.

Head Office:

Surface Measurement Systems, Ltd
5 Wharfside, Rosemont Road
London HA0 4PE, UK
Tel: +44 (0)20 8795 9400
Fax: +44 (0)20 8795 9401
Email: science@smsuk.co.uk

United States Office:

Surface Measurement Systems, Ltd, NA
2125 28th Street SW, Suite I
Allentown PA, 18103, USA
Tel: +1 610 798 8299
Fax: +1 610 798 0334
Email: science@smsna.com

