

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:

E Andrijanto, AE Dawson, and DR Brown, "**Hypercrosslinked polystyrene sulphonic acid catalysts for the esterification of free fatty acids in biodiesel synthesis**" *Applied Catalysis B*, 115-116: 261-268 (2012).

S Alix, L Lebrun, S Marais, E Philippe, A Bourmaud, 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).

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).

W Piskorz, J Grybos, F Zasada, S Cristol, JF Paul, A Adamski, and Z Sojka, "**Periodic DFT and atomistic thermodynamic modeling of the surface hydration equilibria and morphology of monoclinic ZrO<sub>2</sub> nanocrystals**" *Journal of Physical Chemistry C*, 115(49): 24274-24286 (2011).

PA van Meel, SJF Erich, HP Huinink, K Kopinga, J de Jong, and OCG Adan, "**Moisture transport in coated wood**" *Progress in Organic Coatings*, 72(4): 686-694 (2011).

M Vargas, A Albors, A Chiralt, and C Gonzalez-Martinez, "**Water interactions and microstructure of chitosan-methylcellulose composite films as affected by ionic concentration**" *Food Science and Technology*, 44(10): 2290-2295 (2011).

MA Billiris, TJ Siebenmorgen, and A Mauromoustakos, "**Estimating the theoretical energy to dry rice**" *Journal of Food Engineering*, 107(2): 253-261 (2011).

EMW Tsang, ZQ Shi and S Holdcroft, "**Ionic purity and connectivity of proton-conduction channels in fluororous-ionic diblock copolymers**" *Macromolecules*, 44(22): 8845-8857 (2011).

HH Su, XH Zhong, GZ Zhan, YF Yu, and WJ Gan, "**Improvement of interface interaction and conductive anodic filament resistance through amphiphilic oligomeric silane**" *Journal of Applied Polymer Science*, 122(4): 2317-2324 (2011).

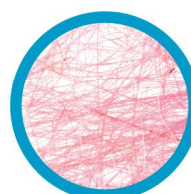
XA Ramoneda, PA Ponce-Cevallos, MD Buera, BE Elizalde, "**Degradation of beta-carotene in amorphous poly matrices. Effect of water sorption properties and physical state**" *Journal of the Science and Food Agriculture*, 91(14): 2587-2593 (2011).

RF Ying, C Barron, L Saulnier, and C Rondeau-Mouro, "**Water mobility within arabinoxylan and beta-glucan films studied by NMR and DVS**" *Journal of the Science of Food and Agriculture*, 91(14): 2601-2605 (2011).

MY Truong, NK Dutta, NR Choudhury, M Kim, CM Elvin, KM Nairn, and AJ Hill, "**The effect of hydration on molecular chain mobility and the viscoelastic behavior of resilin-mimetic protein-based hydrogels**" *Biomaterials*, 32(33): 8462-8473 (2011).

E Dubina, L Wadso, and J Plank, "**A sorption balance study of water vapour sorption on anhydrous cement minerals and cement constituents**" *Cement and Concrete Research*, 44(11): 1196-1204 (2011).

QG He, A Kusoglu, IT Lucas, K Clark, AZ Weber, and R Kostecki, "**Correlating humidity-dependent ionically conductive surface area with transport phenomena in proton-exchange membranes**" *Journal of Physical Chemistry B*, 115(40): 11650-11657 (2011).



# The Total Sorption Solution

JW Rhim, "Water vapor adsorption isotherms of agar-based nanocomposite films" *Journal of Food Science*, 76(8): N68-N72 (2011).

TW Yee, LT Sin, WAWA Rahman, and AA Samad, "Properties and interactions of poly(vinyl alcohol)-sago pith waste biocomposites" *Journal of Composite Materials*, 45(21): 2199-2209 (2011).

## IGC Articles:

JF Gamble, M Leane, D Olusanmi, M Tobyn, E Supuk, J Khoo, and M Naderi, "Surface energy analysis as a tool to probe the surface energy characteristics of micronized materials—A comparison with IGC" *International Journal of Pharmaceutics*, 422: 238-244 (2012).

YH Shish, SM Chou, YH Peng, and M Shih, "Linear salvation relationships used to evaluate sorption mechanisms of VOC's with one organomontmorillonite under different humidities" *Journal of Chemical and Engineering Data*, 56(12): 4950-4955 (2011).

CY Zeng, M Huang, H Zhao, JD Zhou, and JD Li "Solution and diffusion properties of cyclohexane, cyclohexanol, and cyclohexanone in poly(ethylene glycol) by IGC" *Journal of Applied Polymer Science*, 123(1): 124-134 (2012).

YF Luo, Y Zhao, JZ Cai, YX Duan, and SY Du, "Effect of amino-functionalization on the interfacial adhesion of multi-walled carbon nanotubes/epoxy nanocomposites" *Materials & Design*, 33: 405-412 (2012).

DE Taylor, K Runge, MG Cory, DS Burns, JL Vasey, JD Hearn, and MV Henley, "Binding of small molecules to silica surface: comparing experimental and theoretical results" *Journal of Physical Chemistry C*, 115(50): 24734-24742 (2011).

A Blahut and V Dohnal, "Interactions of VOC's with the ionic liquid 1-butyl-1-methylpyrrolidinium dicyanamide" *Journal of Chemical and Engineering Data*, 56(12): 4909-4918 (2011).

N Ramesh, PK Davis, JM Zielinski, RP Danner, and JL Duda "Application of free-volume theory to self diffusion of solvents in polymers below the glass transition temperature: A review" *Journal of Polymer Science B*, 49(23): 1629-1644 (2011).

N Furuyama, S Hasegawa, S Yada, T Hamaura, N Wakyama, E Yonemochi, K Terada, and G Buckton, "Do amorphous troglitazones prepared from two diastereomer-pairs

have the same molecular mobility and crystallization rate at the surface?" *Chemical & Pharmaceutical Bulletin*, 59(12): 1452-1457 (2011).

MLS Batista, CMSS Neves, PJ Carvalho, R Gani, and JAP Coutinho, "Chameleonic behavior of ionic liquids and its impact on the estimation of solubility parameters" *Journal of Physical Chemistry B*, 115(44): 12879-12888 (2011).

SV Blokhina, MV Ol'khovich, AV Sharapova, and NY Borovkov, "Liquid crystalline poly(propyleneimine) dendrimers G1-G4: A chromatographic study on the local ordering of the terminal groups" *Journal of Chemical and Engineering Data*, 56(11): 4208-4216 (2011).

NA Belov, AA Zharov, AV Shashkin, MQ Shaikh, K Raetzke, and YP Yampolskii, "Gas transport and free volume in hexafluoropropylene polymers" *Journal of Membrane Science*, 383(1-2): 70-77 (2011).

H Koivula, HK Alm, and M Toivakka, "Temperature and moisture effects on wetting of calcite surfaces by offset ink constituents" *Colloids and Surfaces A*, 390(1-3): 105-111 (2011).

Q Shen, M Mezgebe, F Li, and JQ Dong, "Liquids adsorption behavior and surface properties of polyanilines doped by lignosulfonate-modified carbon nanotubes" *Colloids and Surfaces A*, 390(1-3): 212-215 (2011).

S Lazarevic, I Jankovic-Castvan, A Onjia, J krstic, D Janackovic, and R Petrovic, "Surface characterization of iron-modified sepiolite by IGC" *Industrial & Engineering Chemistry Research*, 50(20): 11467-11475 (2011).

E Lange and G Kaminska-Bach, "Inverse Gas Chromatography Characterization of Coatings" *JCT Coatingstech*, 8(10): 46-51 (2011).

AL Revilli, F Mutelet, and JN Jaubert, "Extraction of n-alcohols from n-heptane using ionic liquids" *Journal of Chemical and Engineering Data*, 56(10): 3873-3880 (2011).

M Mujiburohman, KA Mahdi, and A Elkamel, "Predictive model of pervaporation performance based on physicochemical properties of permeant-membrane material and process conditions" *Journal of Membrane Science*, 381(1-2): 1-9 (2011).

E Diez, G Ovejero, MD Romero, and I Diaz, "Polymer-solvent interaction parameters of SMS rubbers by IGC measurements" *Fluid Phase Equilibria*, 308(1-2): 107-113 (2011).

Y Li, LS Wang, YX Feng, and CY Zhang, "**Activity coefficients of organic solutes at infinite dilution in ionic liquids. 1**" *Industrial & Engineering Chemistry Research*, 50(18): 10755-10764 (2011).

RW Truss, "**Natural fibers for biocomposites**" *MRS Bulletin*, 36(9): 711-715 (2011).

ZX Zhao, XM Li, and Z Li, "**Adsorption equilibrium and kinetics of p-xylene on chromium-based metal organic framework MIL-101**" *Chemical Engineering Journal*, 173(1): 150-157 (2011).

## New SMS Publications:

### Application Notes

J Khoo, AR Garcia, DJ Burnett, H Abdalghafor, ME Lane, S van Vlierberghe, A dos Santos, V Boterberg, and P Dubruel, "**Vapour permeability of porous materials using Payne Diffusion Cell**" *DVS Application Note 52*.

AR Garcia and D Burnett, "**Moisture sorption and pore collapse of coals**" *DVS Application Note 53*.

AR Garcia and D Burnett, "**Detecting and Modelling Porosity in Natural and Engineered Materials**" *DVS Application Note 54*.

J Khoo, M Naderi, and DJ Burnett, "**Surface Energetic Heterogeneity Profiles by iGC Surface Energy Analyzer**" *IGC Application Note 224*.

DJ Burnett, T Hope, and J Gorgol "**Environmental microscopy using the GenRH-A humidity generator and Mcell accessory**" *GenRH Application Note 501*.

### Case Studies

J Khoo, M Naderi, DJ Burnett, T Freeman, and B Armstrong "**Use of surface energy distributions to relate the effect of surface modification to powder flow properties**" *IGC Case Study 611*.

J Khoo, M Naderi, and DJ Burnett, "**Correlating surface energy heterogeneity measured by Inverse Gas Chromatography to surface cleaning processes**" *IGC Case Study 612*.

DJ Burnett, AR Garcia, J Khoo, GD Wang, and JYY Heng, "**Surface energy distributions and the dissolution rate of Aspirin**" *IGC Case Study 613*.

## Upcoming Conferences:

**Polymer Nanocomposites:** Lehigh University, Bethlehem, PA, USA; 5-7 March 2012 2011.

Oral Presentation: "Anisotropic nature of pharmaceutical powders and its effects on processing and formulation"; Wednesday, 7 March 2012.

**38th Conference on Phase Equilibria (JEEP 2012):** Rouen, France; 28-30 March 2012; Exhibitor

Oral Presentation: "Correlating surface energy distribution to dry milling performance of inorganic solids"

Poster Presentation: "Effect of processing route on physical properties of pharmaceutical solids"

Poster Presentation: "Measuring surface energy heterogeneity of nanomaterials by inverse gas chromatography"

**ANALYTICA:** Munich, Germany; 17-20 April 2012. Exhibit Hall A1, Booth 121.

**World Filtration Conference:** Graz, Austria; 16-20 April 2012.

Poster Presentation: "Characterisation of zeolites and microporous materials by dynamic vapour sorption methods"

## SMS Training:

**SMSNA Office:** 03 April 2012 (DVS); Email [Science@smsna.com](mailto:Science@smsna.com) for details.

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

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