



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

## DVS Articles:

M Saffari and T Langrish, "Effect of lactic acid in-process crystallization of lactose/protein powders during spray drying" *Journal of Food Engineering*, 137: 88-94 (2014).

K Puncochova, JYY Heng, J Beranek, and F Stepanek, "Investigation of drug-polymer interaction in solid dispersion by vapour sorption methods" *International Journal of Pharmaceutics*, 469(1): 159-167 (2014).

JS Stevanic, KS Mikkonen, CL Xu, M Tenkanen, L Berglund, L Salmen, "Wood cell mimicking for composite films of spruce nanofibrillated cellulose with spruce galactoglucomannan and arabinoglucuronoxylan" *Journal of Materials Science*, 49(14): 5043-5055 (2014).

R Ponni, L Rautkari, CAS Hill, and T Vuorinen, "Accessibility of hydroxyl groups in birch kraft pulps quantified by deuterium exchange in D<sub>2</sub>O vapor" *Cellulose*, 21(3): 1217-1226 (2014).

Z Sabzalian, MN Alam, TGM van de Ven, "Hydrophobization and characterization of internally crosslink-reinforced cellulose fibers" *Cellulose*, 21(3): 1381-1393 (2014).

OF Osundahunsi, KT Seidu, and R Mueller, "Effect of presence of sulphurdioxide on acetylation and sorption isotherm of acetylated starches from cultivars of cassava" *Food Chemistry*, 151: 168-174 (2014).

S Ouertani, S Azzouz, L Hassini, A Koubaa, and A Belghith, "Moisture sorption isotherms and thermodynamic properties of Jack pine and palm wood: Comparative study" *Industrial Crops and Products*, 56: 200-201 (2014).

J Vigano, AL Gabas, and J Telis-Romero, "Moisture sorption characteristics of pineapple processing waste: shell and central cylinder" *Journal of Food Process Engineering*, 37(2): 100-110 (2014).

MSA Macena, MLDES Leite, CD Gouveia, TAS de Lima, PAA Athayde, and FB de Sousa, "A comparative study on component volumes from outer to inner dental enamel in relation to enamel tufts" *Archives of Oral Biology*, 59(6): 568-577 (2014).

W Willems, "Hydrostatic pressure and temperature dependence of wood moisture sorption isotherms" *Wood Science and Technology*, 48(3): 483-498 (2014).

W Willems, "The water vapor sorption mechanism and its hysteresis in wood: the water/void mixture postulate" *Wood Science and Technology*, 48(3): 499-518 (2014).

CS Zhou, "Predicting water permeability and relative gas permeability of unsaturated cement-based material from hydraulic diffusivity" *Cement and Concrete Research*, 58: 1413-151 (2014).

DH Zhang, NR Milanovic, YH Zhang, FH Su, and MH Miao, "Effects of humidity conditions at fabrication on the interfacial shear strength of flax/unsaturated polyester composites" *Composites Part B*, 60: 186-192 (2014).

N Follian, C Chappay, E Dargent, F Chivrac, R Cretois, and S Marais, "Structure and barrier properties of biodegradable polyhydroxyalkanoate" *Journal of Physical Chemistry C*, 118(12): 6165-6177 (2014).

I Murriata-Pazos, L Galet, S Patry, C Gaiani, and J Scher, "Evolution of particle structure during water sorption observed on different size fractions of durum wheat semolina" *Powder Technology*, 255: 66-73 (2014).

K Nawaz, SJ Schmidt, and AM Jacobi, "Effect of catalyst used in the sol-gel process on the microstructure and adsorption/desorption performance of silica aerogels" *International Journal of Heat and Mass Transfer*, 74: 25-34 (2014).





K Nawaz, SJ Schmidt, and AM Jacobi, "**Effect of catalyst and substrate on the moisture diffusivity of silica-aerogel-coated metal foams**" *International Journal of Heat and Mass Transfer*, 73: 634-644 (2014).

A Kumar, S Ketel, K Vance, T Oey, N Neithalath, and G Sant, "**Water vapor sorption in cementitious materials-measurement, modeling and interpretation**" *Transport in Porous Media*, 103(1): 69-98 (2014).

## IGC SEA Articles:

AB Nastasovic, NL Ignjatovic, DP Uskokovic, DD Markovic, BM Ekmescic, DD Maksin, and AE Onija, "**Determination of thermodynamic interactions of polylactide and biphasic calcium phosphate/poly lactide composite by IGC at infinite dilution**" *Journal of Material Science*, 49(14): 5076-5086 (2014).

P Lazar, E Otyepkova, P Banas, A Fargasova, K Safarova, L Lapcik, J Pechousek, R Zboril, and M Otyepka, "**The nature of high surface energy sites in graphene and graphite**" *Carbon*, 73: 448-453 (2014).

A Tamayo, L Tellez, M Rodriguez-Reyes, MA Mazo, F Rubio, and J Rubio, "**Surface properties of bioactive TEOS-PDMS-TiO<sub>2</sub>-CaO ormosils**" *Journal of Materials Science*, 49(13): 4656-4669 (2014).

B Strzemiescka, A Voelkel, D Chmielewska, and T Sterzynski, "**Influence of different fillers on phenolic resin abrasive composites**" *International Journal of Adhesion and Adhesives*, 51: 81-86 (2014).

N Karakehya and C Bilgic, "**Surface characterization of montmorillonite/PVC nanocomposites by IGC**" *International Journal of Adhesion and Adhesives*, 51: 140-147 (2014).

VY Gus'kov, YY Gainullina, SP Ivanov, and FKH Kudasheva, "**Properties of the surface of a porous polymer modified with 5-fluorouracil, according to data of gas chromatography**" *Russian Journal of Physical Chemistry A*, 88(6): 1042-1046 (2014).

GC Lainioti, J Kapolos, A Koliadima, and G Karaiskakis, "**Comparative study of the kinetic approach on the alcoholic fermentation procedure conducted in laboratory and scale-up systems by IGC**" *Acta Chromatographica*, 26(2): 371-389 (2014).

IA Sacui, RC Nieuwendaal, DJ Burnett, SJ Stranick, M Jorfi, C Weder, EJ Foster, RT Olsson, and JW Gilman, "**Comparison of the properties of cellulose nanocrystals and cellulose nanofibrils isolated from bacteria, tunicate, and wood processed using acid, enzymatic, mechanical, and oxidative methods**" *ACS Applied Materials & Interfaces*, 6(9): 6127-6138 (2014).

JF Xu, W Shi, ZM Ni, ZY Sun, and PP Qian, "**Surface characterization for anionic-nonionic surfactant modified layered double hydroxides**" *Chinese Journal of Inorganic Chemistry*, 30(5): 977-983 (2014).

LL Qin, SC Zhang, YK Zhang, T Cao, JC Zhao, and ZA Guo, "**Adsorption characterization of hydrofluorocarbons on clay materials**" *Instrumentation Science & Technology*, 42(3):357-367 (2014).

D Olusanmi, D Jayawickrama, DS Bu, G McGeorge, H Sailes, J Kelleher, JF Gamble, UV Shah, and M Tobbyn "**A control strategy for bioavailability enhancement by size reduction: Effect of micronization conditions on the bulk, surface and blending characteristics of an active pharmaceutical ingredient**" *Powder Technology*, 258: 222-233 (2014).

F Bayati, Y Boluk, and P Choi, "**Diffusion behavior of water at infinite dilution in hydroxypropyl xylan films with sorbitol and cellulose nanocrystals**" *ACS Sustainable Chemistry & Engineering*, 2(5): 1305-1311 (2014).

L Boudriche, A Chamayou, R Calvet, B Hamdi, and H Balard "**Influence of different dry milling processes on the properties of an attapulgite clay, contribution of IGC**" *Powder Technology*, 254: 352-363 (2014).

A Voelkel, B Strzemiescka, AA Marek, and J Zawadiak, "**IGC investigation of oxidized polyolefins: Surface properties**" *Journal of Chromatography A*, 1337: 194-201 (2014).

C Bilgic, DT Yazici, N Karakehya, H Cetinkaya, A Singh, and MM Chehimi, "**Surface and interface physicochemical aspects of intercalated organo-bentonite**" *International Journal of Adhesion and Adhesives*, 50: 204-210 (2014).

IM Balashova, E Meco, and RP Danner, "**Diffusion and solubility of hazardous compounds in polyvinyl chloride**" *Fluid Phase Equilibria*, 366: 69-73 (2014).

K Milczewska, A Voelkel, and K Piedzia, "**Interactions in PEG/Aerosil® and PLA/Aerosil® composites described by IGC-determined Flory-Huggins  $\chi_{23}$  parameter**" *Journal of Polymer Research*, 21(4): 305-334 (2014).

M Capece, Z Huang, D To, M Aloia, C Muchira, RN Dave, and AB Yu, "**Prediction of porosity from particle size interactions: Surface modification of fine cohesive powders**" *Powder Technology*, 254: 103-113 (2014).

PF de Oliveira and MDV Marques, "**Comparison between coconut and curaua fibers chemically treated for compatibility with PP matrixes**" *Journal of Reinforced Plastics and Composites*, 33(5): 430-439 (2014).



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## SMS Publications:

Application Notes and Case Studies

**“Characterizing the Restoration Materials for Historic Buildings using Dynamic Vapor Sorption Technique”** DVS Application Note 61.

**“Evaluation of protein hydration by Inverse Gas Chromatography (IGC SEA) and Dynamic Vapor Sorption (DVS)”** SMS Case Study 617.

## Upcoming Conferences:

**Controlled Release Society:** Chicago, IL, USA; 13-16 July 2014; Exhibitor and Presenter.

**APS PharmSci Fair:** University of Hertfordshire, Hatfield, UK; 08-10 September 2014; Exhibitor and Presenter.

**6th International FEZA Conference:** Leipzig, Germany; 08-11 September 2014; Exhibitor and Presenter.

**Particulate Systems Analysis 2014:** Manchester, UK; 15-17 September 2014; Exhibitor.

**8th ECPN International Conference on Nanostructured Polymers and Nanocomposites:** Dresden, Germany; 16-19 September 2014; Exhibitor and Presenter.

**Applied Hair Science Conference:** Princeton, NJ, USA; 18-19 September 2014; Exhibitor.

**SciX 2014:** Reno-Tahoe, NV, USA; 28 September to 03 October 2014; Presenter.

**Polymer Nanocomposites:** Bethlehem, PA, USA; 13-15 October 2014; Exhibitor.

## SMS Training:

**SMSNA Office:** 10 September 2014 (DVS) and 11 September 2014 (IGC-SEA); Email [Science@smsna.com](mailto:Science@smsna.com) for details.

**SMSUK Office:** 17 September 2014 (DVS) and 18 September 2014 (IGC-SEA); Email [Science@smsuk.co.uk](mailto:Science@smsuk.co.uk) for details.

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