

## **Brian Hanley**

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### **ACCOMPLISHMENTS**

- Suggested and implemented Aspen Column Analysis graphical tray/packing module which accounted for approximately 14% of new feature usage in Aspen Plus V9.0.
- Developed state-of-the-art hydraulics/mass transfer models for Aspen Rate-Based Distillation.
- Developed tray/packing hydraulic operating diagram code for Aspen Plus and HYSYS.
- General manager for a privately held company with annual sales of \$5MM.
- Developed column rating and design program for gas scrubbers and strippers.
- Implemented engineering standards and practices, including an inquiry tracking system.
- Developed a financial analysis methodology and linked this to sales predictions
- Modeled the closed cup flash point for multicomponent mixtures – adopted by NFPA in Section 704.
- Developed simple, complete equations for multicomponent diffusion.
- Built and ran two adsorption pilot units: 1) VSA N<sub>2</sub>, and 2) RPSA - 1/2 TPD 30% O<sub>2</sub>.
- Key technical support for employer in \$2,000MM lawsuit.
- 4 patents issued.

### **SKILLS**

- Distillation tray and packed column design, rating, hydraulics, troubleshooting, and mass transfer.
- Engineering project management.
- Process safety assessment (PSA), process safety review (PSR), risk analysis.
- Economic evaluation.
- Carbon capture with aqueous amines.
- Mass and heat transfer.
- C++, FORTRAN, Basic.
- Aspen Plus, HYSYS, Aspen Rate-Based Distillation, process simulation.
- Database mining: prior performance, quality, historical sales, engineering model verification.
- Mathematical modeling and data interpretation.

### **EMPLOYMENT HIGHLIGHTS**

**Aspen Technology, Inc.**

**(11/06- 07/17)**

**Bedford, Massachusetts**

**781.221.6400**

Principal Engineer

- Developed state-of-the-art hydraulics/mass transfer models for Aspen Rate-Based Distillation.
- Developed Aspen Column Analysis graphical tray/packing module: accounted for approximately 14% of new feature usage in Aspen Plus V9.0.
- Wrote engine code for sieve tray, valve tray, bubble cap tray and packing operability diagrams.
- 3 patents issued:

- Method of determining flood points of packed columns – US #8,449,727 B2
- Apparatus and method of designing or optimizing a column for a separation process – US #8,650,013 B2
- Method of optimizing product output rate of packed columns– US #9,095,785 B2

**Koch-Glitsch, LP**

**(4/01- 5/04)**

**Wichita, Kansas**

**316.828.5110**

Principal Engineer (4/01 – 6/05)

- Developed mass transfer coefficient correlations for structured and random packings.
- Developed pressure drop/flood models for structured and random packings.
- Suggested/tested improvements in packing geometrical designs for enhanced capacity/mass transfer.
- 1 patent: Structured packing plate and element and method of fabricating same – US #6,874,769 B2.

**Jaeger Products, Inc.**

**(3/98 – 7/00)**

**Houston, Texas**

**281.449.9500**

General Manager (3/98 – 7/00)

- Oversaw staff of 3 engineers and 2.5 technicians.
- Responsible for overall corporate function, including R&D, design, financial evaluation, economic evaluation, standards and practices, modeling.
- Interacted with sales/marketing to develop strategies for improving market share and company profile.
- Developed an easy to use state-of-the-art software for design of gas scrubbers and gas strippers.

**Air Products and Chemicals, Inc.**

**(3/88 - 1/98)**

**Allentown, Pennsylvania**

**610.481.5900**

Principal Engineer, Corporate Research Services (11/94-1/98)

- Provided physical testing and polymer characterization services, including HPLC, light scattering, RI, physical properties, rheology.

Principal Process Engineer, Corporate Science and Technology (5/90-11/94)

- Involved in R&D on novel PSA/VSA air separation cycles. Performed process economic calculations involving the breakdown of overall cost into capital / operating components and provided technical support to economic evaluation and commercial development.

Engineer, Corporate Engineering (5/89-5/90)

- Supported technical aspects of \$2,000MM litigation against company including material balances, P&ID interpretation, and modeling of liquid and vapor releases.
- Built a “plume” generating cannon to study high pressure gas releases.

Engineer, Engineering Technology (3/88-5/89)

- Studied the performance of packed distillation columns. Developed a model which defined the locus of acceptable column parameters for use in cryogenic air separation, resulting in \$1MM/year in savings and improved column performance.
- Read and interpreted PFD's, P&ID's, process data.
- Supported \$2,000MM litigation against company.
- Developed model for ballistic trajectories of molten steel particles.
- Evaluated mass transfer performance of various distillation tray designs.

**EDUCATION**

- University of Minnesota                      Ph.D. Chemical Engineering                      1987
- University of Massachusetts                B.S. Chemical Engineering                      1979

**PUBLICATION HIGHLIGHTS**

On Packed Column Hydraulics, *AIChE J.* **2012**, 58(6), 1671.

New Mass Transfer Correlations for Packed Towers, *AIChE J.* **2012**, 58(1), 132.

The Influence of Flow Maldistribution on the Performance of Columns Containing Random Packings: A Model Study for Constant Relative Volatility and Total Reflux, *Sep. Purif. Tech.* **1999**, 16(1), 7.

A Practical Friction Based Approach to Multicomponent Diffusion, *AIChE J* **1999**, 1, 1.

Experimental Flash Points of Industrial Amines, *J. Chem. Eng. Data* **1999**, 44(2), 209.

A Model for the Calculation and the Verification of Closed Cup Flash Points for Multicomponent Mixtures, *Process Safety Progress* **1998**, 17(2), 49.

Production of Oxygen Enriched Air by Rapid Pressure Swing Adsorption, *Adsorption* **1995**, 1, 313.

A Unified Model for Countercurrent Vapor/Liquid Packed Columns. 1. Pressure Drop, *Ind. Eng. Chem. Res.* **1994**, 33, 1208.

A Unified Model for Countercurrent Vapor/Liquid Packed Columns. 2. Equations for the Mass Transfer Coefficients, Mass Transfer Area, the HETP, and the Dynamic Liquid Holdup, *Ind. Eng. Chem. Res.* **1994**, 33, 1222.

Dispersion of Instantaneous Jets, *Process Safety Progress* **1994**, 13, 35.

Fractionated Vacuum Swing Adsorption Process for Air Separation, *Separation Science and Technology* **1994**, 28, 2553.

Synthesis and Characterization of Poly(vinylmethyl ether), *Polym. Comm.* **1989**, 30(1), 19. 13 citations.

Translational Diffusion of Linear Polystyrenes in Dilute and Semidilute Solutions of Poly(vinyl methyl ether), *Macromolecules* **1987**, 20, 1120.

The Effect of Polydispersity on the Analysis of Optical Tracer Diffusion Experiments II. Intramolecular Interference, *Polymer Bulletin* **1987**, 17, 279.

The Effect of Polydispersity on the Analysis of Optical Tracer Diffusion Experiments, *Polymer Bulletin* **1986**, 15, 35.

Incorporating Diffusion Data Into a Model for High Conversion Free Radical Polymerization, *Polymer Preprints* **1985**, Miami, FL.

Behavior of the Tracer Diffusion Coefficient of Polystyrene in Isorefractive Solvents Composed of Poly(vinyl methyl ether) and o-Fluorotoluene, *Polym Bull. (Berlin)* **1985**, 14(2), 137.

An Experimental Study of Polymer Diffusion in Concentrated Solution: Implications for Diffusion in Polymerization, *Chem. Eng. Commun.* **1983**, 24, 93.