Introduction to OGT, Inc.

CAPE-OPEN Annual Meeting

BP Offices, Sunbury on Thames, England

October 2017

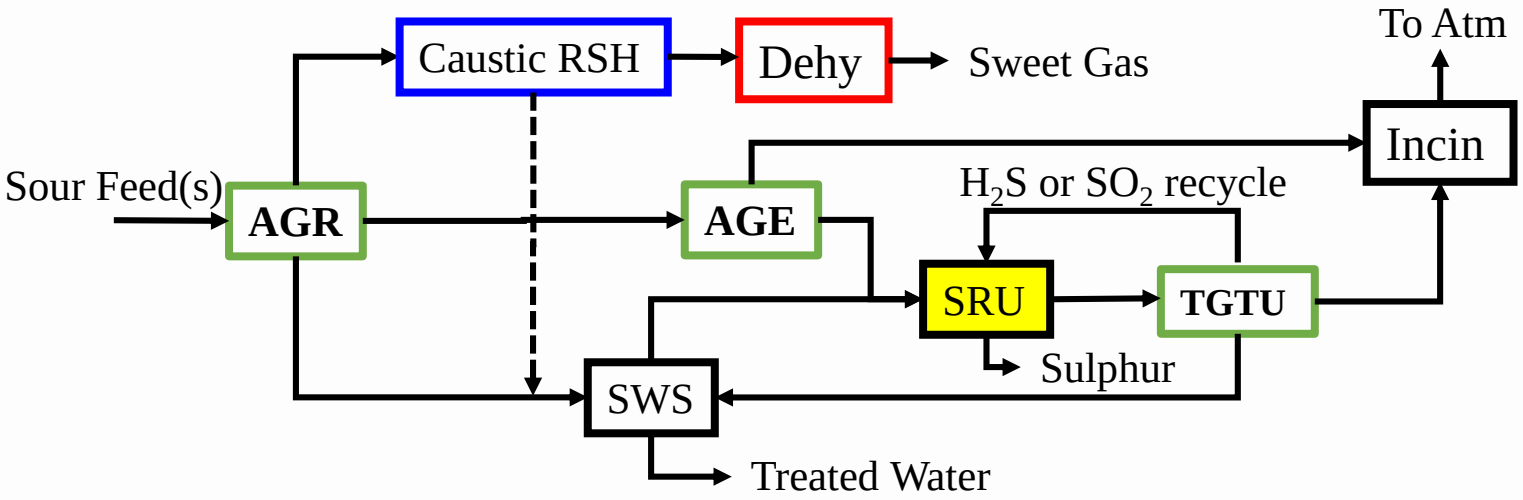
Company Overview

- Dr. Ralph Weiland – President
  - 30 years Chemical Engineering Professor / Researcher
  - 10 years in Mass Transfer with Koch-Glitsch
    - Lead Inventor of ULTRA-FRAC® trays
- Business Office
  - Located in Houston, Tx
  - Lead by Michael Jakobs, Business Director
- Technical Development Office
  - Located near Austin, Tx
  - Lead by Nate Hatcher, Technical Development Lead

ProTreat®

- Simulation tool for:
  - Amine Treating
  - Physical Solvent Treating
  - Carbon Capture
  - Sour Water Strippers
  - Caustic Treating
  - Sulphur Recovery
- Fully flexible flowsheeting tool

What can ProTreat Simulate?



ProTreat® features

- Rigorous electrolyte aqueous thermodynamics
- Many solvents available
  - Generic and licensed amines
  - Blend up to three amines
  - Physical solvents and Amino acids
  - NaOH, KOH, K_2CO_3
- Gas components
  - Acid gases including SO_2, HCN
  - Ammonia
  - RSH, Phenol, Methanol
- Common Heat Stable Salt ions / Stripping Promoters
- Hydrocarbon / BTEX solubility in amines and physical solvents

ProTreat® features

Rigorous Sulphur Recovery Model

- Unique aspects of sulphur vapor / molten sulphur
  - Variable Mole Weight
  - H_2S solubility
  - Viscosity / Heat Capacity inflections
- Reaction Furnace with kinetic ammonia / HC destruction
- WHB with rigorous heat transfer, chemical reactions
- Sulphur condenser
- Converter

Our Customers – Operators / Suppliers

Our Customers – Engineering / Consulting

Our Customers – Engineering / Consulting

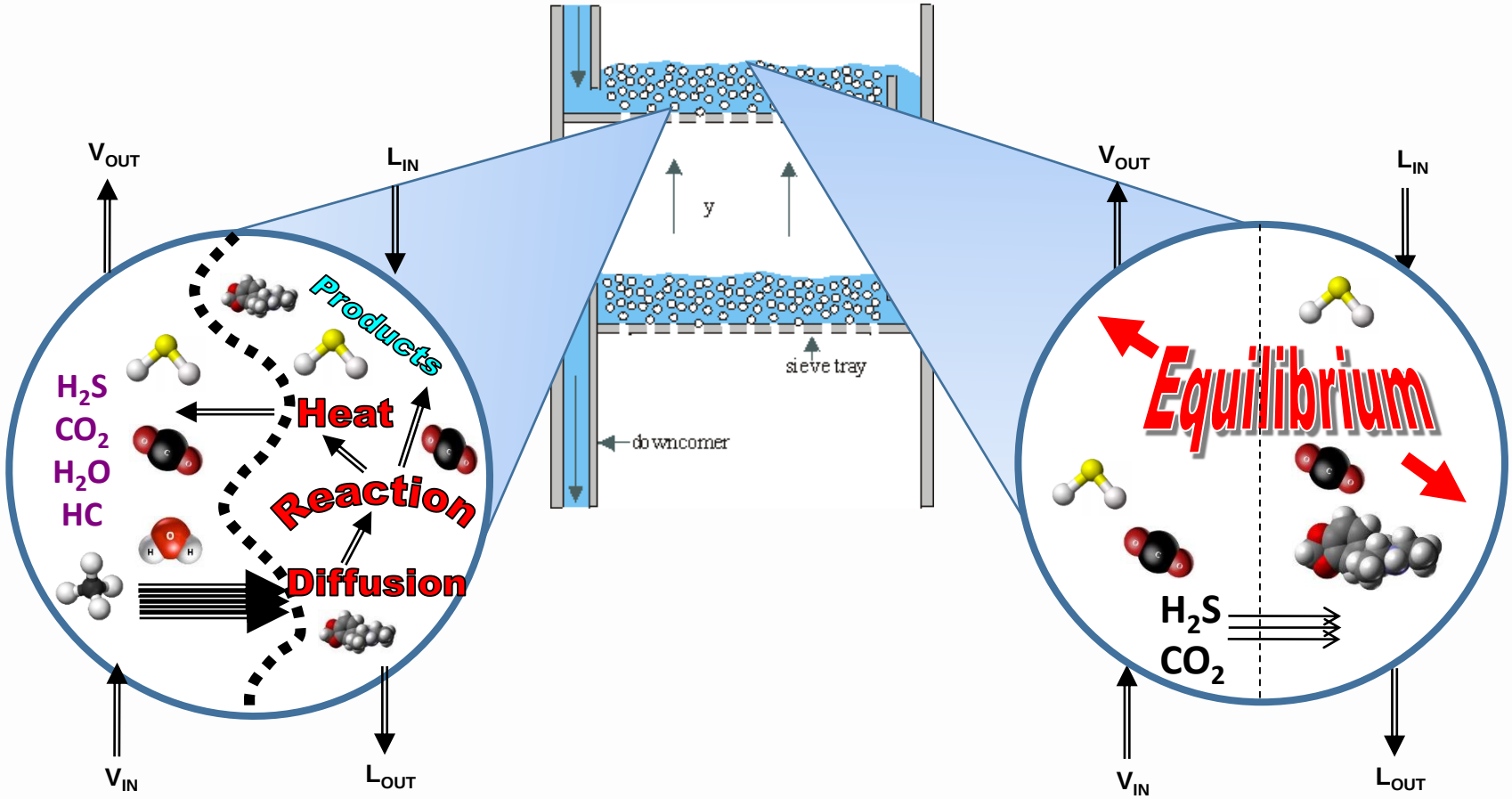
A Navratna Company

It's all about Imagineering

How is the ProTreat Column Model Different?

- Column calculations are based on mass transfer and heat transfer rates
- Directly calculates tray-by-tray performance
- *Predicts* actual mass transfer
  - ProTreat does not calculate equilibrium then offset it by a user-supplied factor
  - No translation from ideal stages to real tower internals
  - No tray efficiency; no HETP
- User is not required to provide tuning factors
- Real trays, random packing, structured packing — hydraulics and mass transfer

Mass Transfer Rate Model vs Ideal-Stage Model



ProTreat's COM Interface

- Currently, a proprietary COM interface structure
- Allows 3rd party program to
  - Set input values
  - Execute the program to generate results
  - Retrieve calculated result values
- Current status
  - ProTreat flowsheet block available in VMG-Sim
  - Spreadsheet unit monitoring / flowsheet calc templates using VBA

CAPE-OPEN plan

- Use COM as the underlying technology to implement the CAPE-OPEN interface
- Implementation priorities
  - Unit Operations module, e.g. allow ProTreat columns to be integrated with other simulators
  - Thermo & Physical Props module, e.g. allow HTRI to use ProTreat for stream calculations within a heat exchanger
- Goal
  - Enable both Unit Operations and Thermo / Physical Props over the next year

Our next steps

- Digest CAPE-OPEN documentation
- Begin implementing Unit Operations module

- Question:
- What technical support is available from CO-LaN?
  - Consultancy
  - Tech Support Single-Point-Of-Contact

ProTreat®

The industry's most powerful gas treating and sulphur recovery simulation tool