PetroPhase

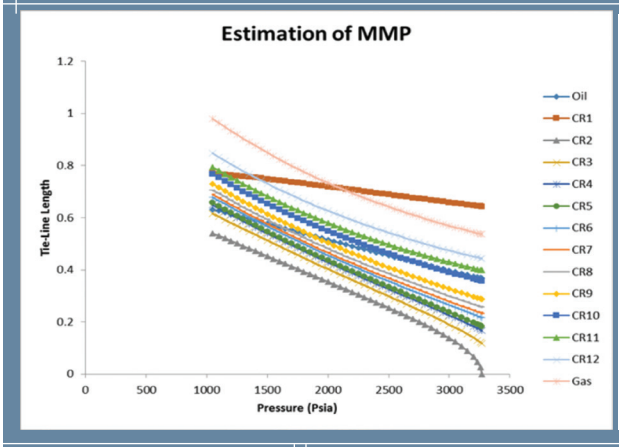
— INNOVATIVE EOS MODELING FOR RESERVOIR SIMULATION AND EOR —

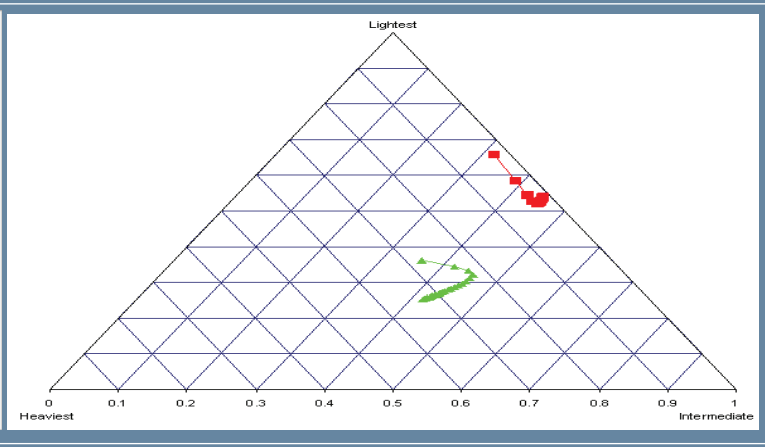
FEATURES:

- EXCEL FRIENDLY INPUT, FLEXIBLE IMPORT FROM VARIOUS SIMULATORS
- SIMULATION OF DIFFERENT PVT EXPERIMENTS, INCLUDING MMP
- CHARACTERIZATION OF HYDROCARBON HEAVY ENDS WITH DIFFERENT MODELS AND CORRELATIONS
- ROBUST REGRESSION ALGORITHM WITH ABILITY TO TUNE MMP
- ABILITY TO HANDLE WAX AND ASPHALTENE PRECIPITATION
- QUALITY CHECK DATA AND CORRECTION MODULE

BENEFITS:

- EASY AND INTUITIVE CHARACTERIZATION WORKFLOW
- FAST AND ACCURATE SIMULATION RESULTS
- PROVIDES ACCURATE CHARACTERIZATION FOR HEAVY COMPONENTS
- ALLOWS FOR ENHANCED EOS TUNING
- FACILITATES THE DESIGN OF OPTIMUM SEPARATOR CONDITIONS
- EXPORTS EOS FILES IN VARIOUS RESERVOIR SIMULATOR FORMATS





Plano Research Corporation

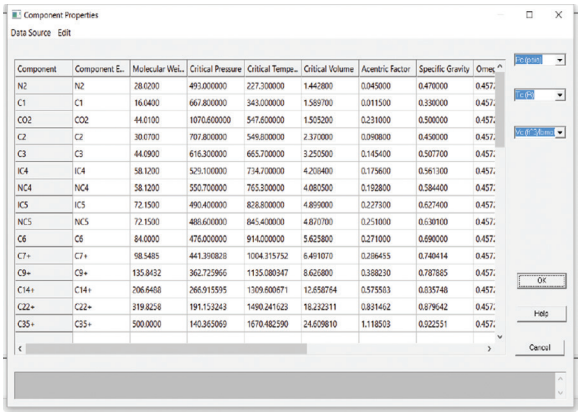
PetroPhase is a Windows-based, state-of-the-art PVT phase package. Using a generalized three-parameter equation of state (EOS), PetroPhase can simulate laboratory experiments, characterize hydrocarbon components, match PVT data, investigate miscibility, facilitate the optimization of separator trains, and prepare PVT input data for black oil and compositional simulators. PetroPhase provides a simple and efficient user interface to input, validate, and save data. Its robust calculation engine provides reliable simulation, characterization, and regression results. PetroPhase also exports to Excel to streamline reporting and analysis.

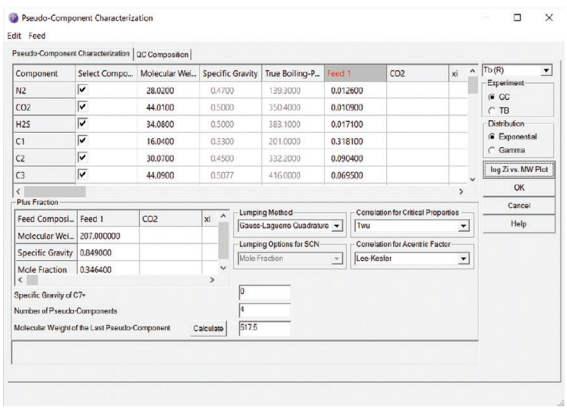
EOS Data Input

- Input data in different units
- Utilize Peng-Robinson or SRK EOS options
- Access component properties from a database, characterization method, or user input
- Determine binary interaction parameters from a database, user input, or different correlations
- Select volume shift parameters for PR or SRK EOS automatically
- Combine data from multiple feed compositions
- Use user-specified reference conditions
- Import EOS models from industry standard simulators

Characterization

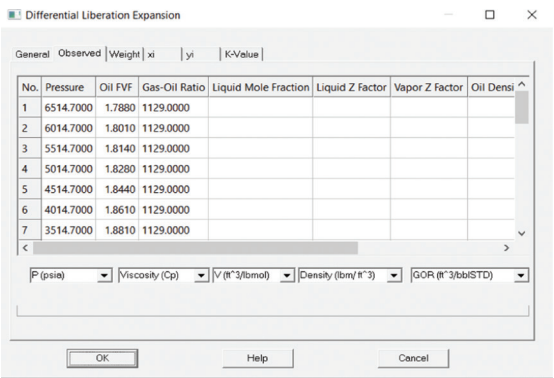
- Quality check and adjust composition, molecular weight, equilibrium data
- Automatic initial characterization option
- Use different distribution models (modified Whitson's method as default)
- Extend fluid analysis interactively using different procedures
- Select pseudo-component groups and different lumping schemes automatically
- Calculate component properties with different correlations

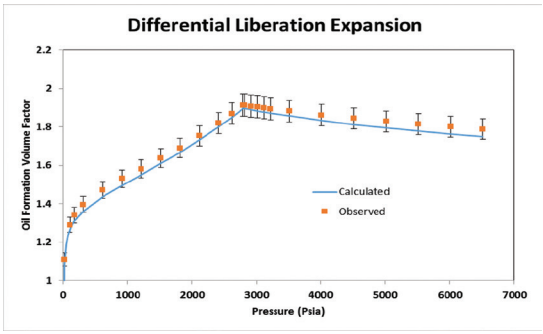




PVT Experiment Simulation

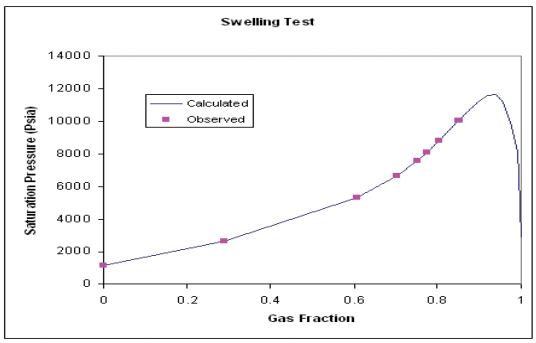
- Unlimited number of experiments
- Constant composition expansion (CCE)
- Constant volume depletion (CVD)
- Differential liberation expansion (DLE)
- Saturation pressure (SAT)
- Minimum miscibility pressure or enrichment (MMP/MME) for different drive mechanisms
- Swelling Test (SWE)
- Multi-stage separator test (SEP)
- Multi-contact test (MCT)
- Wax precipitation
- Asphaltene precipitation
- Vapor-liquid two-phase flash (VLE)
- Multi-phase flash
- Compositional grading





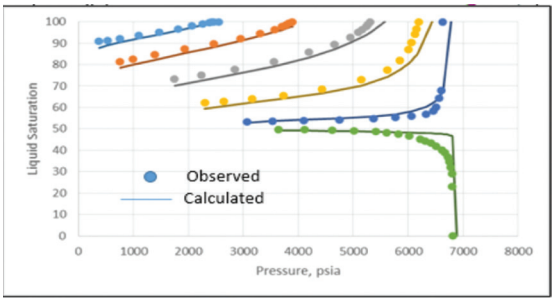
EOS Tuning

- Multiple experiment selection, including MMP
- Multi-sample simultaneous regression capability
- Sensitivity analysis
- Audit, edit, and return to prior regressions conveniently
- Regression comparison chart
- Detailed regression report



Outputs

- Generate Excel-compatible graphics and tables
- Detailed output report
- Generate outputs for multiple experiments with single click
- Export EOS information to black-oil or compositional simulators
- Produce pseudo-ternary diagrams, finger plots, and phase envelope illustrations



ABOUT PLANO RESEARCH:

- Plano Research Corporation provides a wide array of sophisticated products for the oil and gas sector. Our proprietary technology has been designed to simplify and speed up the analysis of routine and complex problems faced by geoscientists and engineers during all phases of the oil and gas exploration and development. Currently, we offer the following products:

FlowSim (a black oil and compositional reservoir simulator),
CAESAR (a well and reservoir management application),
Transients+ (a pressure transient analysis package),
Analytics (a waterflood optimization tool),
PetroPhase (a phase behavior software package),
PVT (a fluid property data application),
Oil3D (a gas, oil, and water simulation tool),
GeoTrak (a resource analysis and exploration toolkit),
PetroTrak (an online well and field management application),
CoreLog (a petrophysical interpretation tool),
Galaxy4D (a reservoir characterization software),
Sigma (a seismic interpretation package), and
SmartEOR (an EOR screening tool).

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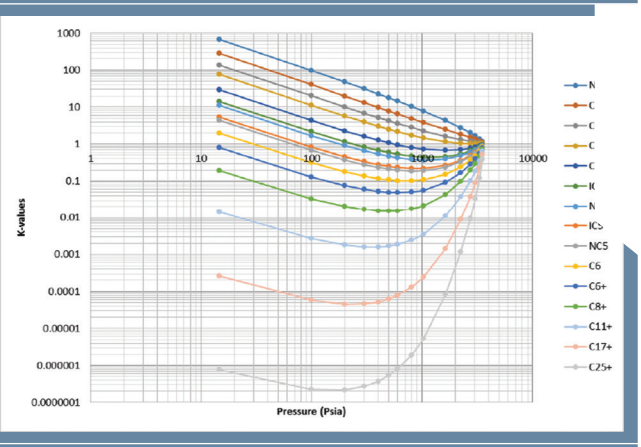

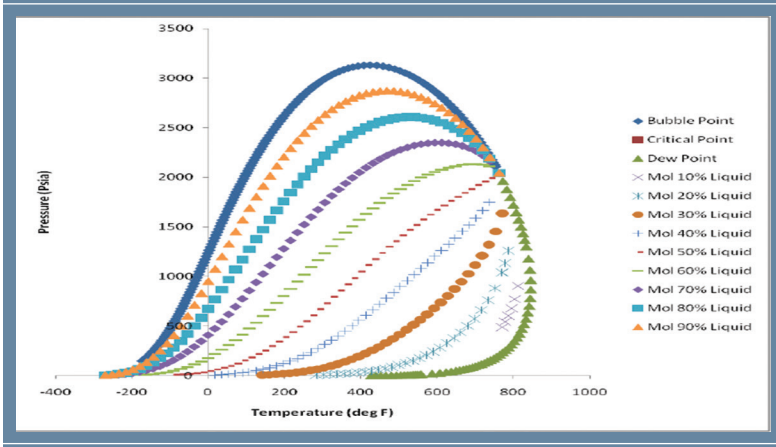

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