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# PVT Modelling and Flow Assurance with Multiflash®

## 1. Introduction

Tutor(s)

Course objectives

Training materials

## 2. Multiflash fundamentals

Model fundamentals

Features of Multiflash

Choice of thermodynamic models

Choice of transport property models

## 3. Flash calculations

Flash calculations

Fixed phase flash and tolerance calculations

Solid freeze-out for pure solids

Mercury partitioning

## 4. Fluid Characterisation

Using data from a PVT report

Oil and condensate characterisation



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Simultaneous characterisation of multiple fluids  
Importing a characterised fluid into Multiflash  
Component lumping/delumping  
Flash calculations, dew points, phase envelopes

## **5. PVT lab and fluids regression**

EOS tuning and matching of properties  
PVT experiments modelling and data regression  
Sample QC  
Mud decontamination  
Multi-stage flash and recombination

## **6. Natural gas hydrates and hydrates inhibition**

Overview of gas hydrates  
Gas hydrate model in Multiflash  
Hydrate formation and phase boundary calculations  
Overview of hydrate inhibitors  
Hydrate inhibitor models in Multiflash  
How to calculate the amount of hydrate inhibitors  
Inhibition effect of salts

## **7. Wax precipitation**

Overview of petroleum waxes  
Thermodynamic wax model in Multiflash  
Waxy crude/condensate characterization  
Tuning the wax model to match experimental data  
Impact of wax precipitation on wax deposition



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## **8.     Asphaltenes**

Overview of asphaltenes

The Multiflash asphaltene model

Asphaltene precipitation curve and phase envelope calculations

Modelling the effect of gas injection on asphaltene stability in crudes

Effect of blending on asphaltene flow assurance

## **9.     Multiflash Excel Interface**

Multiflash Excel functions and function arguments

Setting up an Excel application

## **10.    Case Studies**

Solve problems, involving various topics, using the Multiflash GUI and/or Excel.

Main topics

- Fluid characterisation – analysis of PVT reports, model set up and simulations
- Wax separation
- Hydrates formation
- Asphaltenes precipitation