CLAIMS

What is claimed is:

1. A method of using data obtained from a sample of a reservoir fluid comprising:

collecting the sample in a sample container,

wherein the sample container includes a sample receptacle stored within the sample container, the sample receptacle being removable from the sample container, and

wherein the step of collecting comprises allowing or causing the sample to flow into the sample receptacle;

determining at least one compositional component of the sample using an analyzer, wherein the step of determining is performed during the step of collecting; and

using an equation of state to predict a potential change in at least one property of the reservoir fluid based on the determination of the at least one compositional component of the sample,

wherein the step of determining is performed during fluid flow of the sample.

2. The method according to Claim 1, wherein the at least one compositional component is selected from the group consisting of: asphaltenes; saturates; resins; aromatics; solid particulate content; hydrocarbon composition and content; gas composition carbon 1 to carbon 13 (C_1 - C_{13}) and content; carbon dioxide gas; hydrogen sulfide gas; total stream percentage of water, gas, oil, and solid particles; water elements including ion composition and content, anions, cations, salinity, organics, contamination; or other hydrocarbon, gas, solids, or water properties that can be related to spectral characteristics, including the use of regression methods.

3. The method according to Claim 1, wherein the number of compositional components of the sample determined is in the range of about 6 to greater than 20.

4. The method according to Claim 1, further comprising the step of selecting the equation of state to be used.

5. The method according to Claim 4, wherein at least a sufficient number of compositional components are determined such that the exact equation of state to be used can be selected.

6. The method according to Claim 1, wherein the equation of state is selected from the group consisting of Boyle, Van der Waals, Redlich-Kwong (RK) , Soave-Redlich-Kwong (SRK) , Reng-Robinson (PR), Peng-Robinson-Stryj ek-Vera (PRSV) , Patel-Teja (PT) , Schmit-Wenzel (SW) , and Esmaeilzadeh-Roshanfekr (ER) .

7. The method according to Claim 1, wherein the at least one property is selected from the group consisting of weight, volume, mass, density, phase, composition, and combinations thereof .

8. The method according to Claim 1, further comprising the step of inputting at least one state function into the equation of state.

9. The method according to Claim 8, wherein the state function is selected from the group consisting of temperature, pressure, volume, density, composition, and combinations thereof.

10. The method according to Claim 9, further comprising the step of solving the equation of state using the at least one compositional component of the fluid and the input state function.

11. A method of using data obtained from a sample of a reservoir fluid comprising:

collecting the sample in a sample receptacle, the sample receptacle being stored within a sample container,and being removable from the sample container;

transferring the sample from the sample container to a second container, wherein the step of transferring is performed after the step of collecting;

determining at least one compositional component of the sample using an analyzer, wherein the step of determining is performed after the step of collecting; and

using an equation of state to predict a potential change in at least one property of the reservoir fluid based on the determination of the at least one compositional component of the sample,

wherein the step of determining is performed during fluid flow of the sample.

12. The method according to Claim 11, wherein the step of determining the at least one compositional component of the sample is performed during the step of transferring the sample from the sample container to the second container.

13. The method according to Claim 11, wherein the at least one compositional component is selected from the group consisting of: asphaltenes; saturates; resins; aromatics; solid particulate content; hydrocarbon composition and content; gas composition carbon 1 to carbon 13 (C_1 - C_{13}) and content; carbon dioxide gas; hydrogen sulfide gas; total stream percentage of water, gas, oil, and solid particles; water elements including ion composition and content, anions, cations, salinity, organics, contamination; or other hydrocarbon, gas, solids, or water properties that can be related to spectral characteristics, including the use of regression methods.

14. The method according to Claim 11, wherein the number of compositional components of the sample determined is in the range of about 6 to greater than 20.

15. The method according to Claim 11, further comprising the step of selecting the equation of state to be used.

16. The method according to Claim 15, wherein at least a sufficient number of compositional components are determined such that the exact equation of state to be used can be selected .

17. The method according to Claim 11, wherein the equation of state (EOS) is selected from the group consisting of Boyle, Van der Waals, Redlich-Kwong (RK) , Soave-Redlich-Kwong (SRK) , Peng-Robinson (PR), Peng-Robinson-Stryjek-Vera (PRSV) , Patel-Teja (PT) , Schmit-Wenzel (SW) , and Esmaeilzadeh-Roshanfekr (ER) .

18. The method according to Claim 11, wherein the at least one property is selected from the group consisting of weight, volume, mass, density, phase, composition, and combinations thereof.

19. The method according to Claim 11, further comprising the step of inputting at least one state function into the equation of state.

20. The method according to Claim 19, wherein the state function is selected from the group consisting of temperature, pressure, volume, density, composition, and combinations thereof.

21. The method according to Claim 20, further comprising the step of solving the equation of state using the at least one compositional component of the fluid and the input state function.

CLAIMS

1. A method of using data obtained from a sample of a reservoir fluid comprising:

collecting the sample in a sample container,

wherein the sample container includes a sample receptacle, and

wherein the step of collecting comprises allowing or causing the sample to flow into the sample receptacle;

determining at least one compositional component of the sample using an analyzer, wherein the step of determining is performed during the step of collecting; and

using an equation of state to predict a potential change in at least one property of the reservoir fluid based on the determination of the at least one compositional component of the sample,

wherein the step of determining is performed during fluid flow of the sample.

2. The method according to Claim 1, wherein the at least one compositional component is selected from the group consisting of: asphaltenes; saturates; resins; aromatics; solid particulate content; hydrocarbon composition and content; gas composition carbon 1 to carbon 13 (C_1 - C_{13}) and content; carbon dioxide gas; hydrogen sulfide gas; total stream percentage of water, gas, oil, and solid particles; water elements including ion composition and content, anions, cations, salinity, organics, contamination; or other hydrocarbon, gas, solids, or water properties that can be related to spectral characteristics, including the use of regression methods.

3. The method according to Claim 1, wherein the number of compositional components of the sample determined is in the range of about 4 to greater than 20.

4. The method according to Claim 1, further comprising the step of selecting the equation of state to be used.

5. The method according to Claim 4, wherein at least a sufficient number of compositional components are determined such that the exact equation of state to be used can be selected.

6. The method according to Claim 1, wherein the equation of state is selected from the group consisting of Boyle, Van der Waals, Redlich-Kwong (RK), Soave-Redlich-Kwong (SRK), Peng-Robinson (PR), Peng-Robinson-Stryjek-Vera (PRSV), Patel-Teja (PT), Schmit-Wenzel (SW), and Esmaeilzadeh-Roshanfekr (ER).

7. The method according to Claim 1, wherein the at least one property is selected from the group consisting of weight, volume, mass, density, phase, composition, and combinations thereof.

8. The method according to Claim 1, further comprising the step of inputting at least one state function into the equation of state.

9. The method according to Claim 8, wherein the state function is selected from the group consisting of temperature, pressure, volume, density, composition, and combinations thereof.

10. The method according to Claim 9, further comprising the step of solving the equation of state using the at least one compositional component of the fluid and the input state function.

11. A method of using data obtained from a sample of a reservoir fluid comprising:

collecting the sample in a sample container;

transferring the sample from the sample container to a second container, wherein the step of transferring is performed after the step of collecting;

determining at least one compositional component of the sample using an analyzer, wherein the step of determining is performed after the step of collecting; and

using an equation of state to predict a potential change in at least one property of the reservoir fluid based on the determination of the at least one compositional component of the sample,

wherein the step of determining is performed during fluid flow of the sample.

12. The method according to Claim 11, wherein the step of determining the at least one compositional component of the sample is performed during the step of transferring the sample from the sample container to the second container.

13. The method according to Claim 11, wherein the at least one compositional component is selected from the group consisting of: asphaltenes; saturates; resins; aromatics; solid particulate content; hydrocarbon composition and content; gas composition carbon 1 to carbon 13 (C_1 - C_{13}) and content; carbon dioxide gas;

hydrogen sulfide gas; total stream percentage of water, gas, oil, and solid particles; water elements including ion composition and content, anions, cations, salinity, organics, contamination; or other hydrocarbon, gas, solids, or water properties that can be related to spectral characteristics, including the use of regression methods.

14. The method according to Claim 11, wherein the number of compositional components of the sample determined is in the range of about 4 to greater than 20.

15. The method according to Claim 11, further comprising the step of selecting the equation of state to be used.

16. The method according to Claim 15, wherein at least a sufficient number of compositional components are determined such that the exact equation of state to be used can be selected.

17. The method according to Claim 11, wherein the EOS is selected from the group consisting of Boyle, Van der Waals, Redlich-Kwong (RK), Soave-Redlich-Kwong (SRK), Peng-Robinson (PR), Peng-Robinson-Stryjek-Vera (PRSV), Patel-Teja (PT), Schmit-Wenzel (SW), and Esmaeilzadeh-Roshanfekr (ER).

18. The method according to Claim 11, wherein the at least one property is selected from the group consisting of weight, volume, mass, density, phase, composition, and combinations thereof.

19. The method according to Claim 11, further comprising the step of inputting at least one state function into the equation of state.

20. The method according to Claim 19, wherein the state function is selected from the group consisting of temperature, pressure, volume, density, composition, and combinations thereof.

21. The method according to Claim 20, further comprising the step of solving the equation of state using the at least one compositional component of the fluid and the input state function.