WHAT IS CLAIMED IS:

1. A method for controlling a process for refining crude oil to mitigate fouling comprising:

deploying a refractive index probe at a location suitable for making a crude oil stability determination;

making a measurement of crude oil stability; and

then controlling the process for refining crude oil by maintaining the process or implementing a change to the process, based upon the determination of crude oil stability;

wherein the crude oil stability determination is relevant to controlling the refining process.

2. The method of Claim 1 wherein the making a measurement of crude oil stability is performed by a process comprising a first part and a second part.

3. The method of Claim 2 wherein the first part of the process is measuring RI parameters online using a refractive index probe.

4. The method of Claim 3 wherein the second part of the process is converting the RI parameters into a "solubility blending number" (SB_n) based on a linear correlation.

5. The method of Claim 4 wherein the linear correlation is established using the New Mexico Petroleum Recovery Research Center method designated as PRRC 01-18.

6. The method of Claim 1 further comprising periodically determining the accuracy of the SB_n determination using a turbidimetric flocculation titration method as a check on accuracy.

7. The method of Claim 4 further comprising making an Asphaltene Stability Index determination for crude oil at or near the point of the refractive index probe location.

8. The method of Claim 7 further comprising correlating SB_n determined using the refractive index probe with the ASI determination.

9. The method of Claim 8 further comprising adjusting refining unit variables to influence crude oil stability using the correlated SB_n.

10. The method of Claim 9 wherein refining unit variables include, but are not limited to the adding or removing heat to the process streams and residence time inside of reactors, reformers, cokers and other types of refinery equipment.

11. The method of Claim 8 further comprising employing an additive to improve the stability of the combined feed stream.

12. A method of transporting or storing crude oil to mitigate fouling comprising:
deploying a refractive index probe in a crude oil transportation or storage system;
making a measurement of crude oil stability; and
then controlling the process for transporting or storing the crude oil by maintaining the process or implementing a change to the process, based upon the determination of crude oil stability.

13. The method of Claim 12 wherein the making a measurement of crude oil stability is performed by a process comprising a first part and a second part wherein:
the first part of the process is measuring RI parameters online using a refractive index probe;

the second part of the process is converting the RI parameters into a "solubility blending number" (SB_n) based on a linear correlation; and
the linear correlation is established using the New Mexico Petroleum Recovery Research Center method designated as PRRC 01-18.

14. The method of claim 13 further comprising periodically determining the accuracy of the SB_n determination using a turbidimetric flocculation titration method as a check on accuracy.

15. The method of Claim 14 further comprising making an Asphaltene Stability Index determination for crude oil at or near the point of the refractive index probe location.

16. The method of Claim 15 further comprising correlating SB_n determined using the refractive index probe with the ASI determination.

17. The method of Claim 16 further comprising using the correlated SB_n to adjusting crude oil storage or transportation variables to improve crude oil stability.

18. The method of Claim 16 further comprising using an additive to improve crude oil stability based upon the correlated SBn.

19. A method of monitoring the blending of two or more crude oil streams to form a combined feed stream to identify the stability of the two or more crude oil feed streams and to avoid inducing fouling by the combined feed stream comprising employing a refractive index probe to measure at least the stability of the combined streams.

20. The method of Claim 19 wherein:
the making a measurement of crude oil stability is performed by a process comprising a first part and a second part wherein:
the first part of the process is measuring RI parameters online using a refractive index probe;
the second part of the process is converting the RI parameters into a "solubility blending number" (SB_n) based on a linear correlation; and
the linear correlation is established using the New Mexico Petroleum Recovery Research Center method designated as PRRC 01-18; and
the method further comprises:
periodically determining the accuracy of the SB_n determination using a turbidimetric flocculation titration method as a check on accuracy;
making an Asphaltene Stability Index determination for crude oil at or near the point of the refractive index probe location; and
correlating SB_n determined using the refractive index probe with the ASI determination;
using the correlated SB_n to adjusting the order of blending of fees streams to improve crude oil stability of a combined feed stream.

21. The method of Claim 20 wherein the two or more crude oil streams are a heavy crude oil stream and a shale oil stream.

What is claimed is:

1. A method for controlling a process for refining crude oil to mitigate asphaltene fouling comprising:

deploying a refractive index probe at a location suitable for making a crude oil stability determination, wherein the location is selected from the group consisting of: into a feed going into a desalting unit, into a heat exchanger, into a pre-heater, and combinations thereof;

making a measurement of crude oil stability by a process comprising:

a first part of measuring RI parameters online using the refractive index probe; and

a second part of the process of converting the RI parameters into a "solubility blending number" (SB_n) based on a linear correlation; and

then controlling the process for refining crude oil using the SB_n by maintaining the process or implementing a change to the process, based upon the determination of crude oil stability, wherein the controlling is changing a unit residence time.

2. The method of claim 1 wherein the linear correlation is established using the New Mexico Petroleum Recovery Research Center method designated as PRRC 01-18.

3. The method of claim 1 further comprising periodically determining the accuracy of the SB_n determination using a turbidimetric flocculation titration method as a check on accuracy.

4. The method of claim 1 further comprising making an Asphaltene Stability Index determination for crude oil at or near the point of the refractive index probe location.

5. The method of claim 4 further comprising correlating the SB_n determined using the refractive index probe with the ASI determination and using the correlated SB_n in controlling the process.

6. A method of transporting or storing crude oil to mitigate asphaltene fouling comprising:

deploying a refractive index probe in a crude oil transportation or storage system;

making a measurement of crude oil stability by a process comprising a first part and a second part; wherein:

the first part of the process is measuring RI parameters online using a refractive index probe;

the second part of the process is converting the RI parameters into a "solubility blending number" (SBn) based on a linear correlation;

the linear correlation is established using the New Mexico Petroleum Recovery Research Center method designated as PRRC 01-18; and

then controlling the process for transporting or storing the crude oil by maintaining the process or implementing a change to the process, based upon the determination of crude oil stability, wherein the controlling is changing a unit residence time.

7. The method of claim 6 further comprising periodically determining the accuracy of the SB_n determination using a turbidimetric flocculation titration method as a check on accuracy.

8. The method of claim 7 further comprising making an Asphaltene Stability Index determination for crude oil at or near the point of the refractive index probe location.

9. The method of claim 8 further comprising correlating SB_n determined using the refractive index probe with the ASI determination.

10. The method of claim 9 further comprising using the correlated SB_n to control the process to improve crude oil stability.

11. A method of monitoring the blending of two or more crude oil streams to form a combined feed stream to identify the stability of the two or more crude oil feed streams and to avoid asphaltene fouling by the combined feed stream comprising:

employing a refractive index probe to measure at least the stability of the combined streams;

wherein the measuring at least the stability is performed by a process comprising a first part and a second part;

the first part of the process is measuring RI parameters online using a refractive index probe;

the second part of the process is converting the RI parameters into a "solubility blending number" (SBn) based on a linear correlation; and the linear correlation is established using the New Mexico Petroleum Recovery Research Center method designated as PRRC 01-18;

wherein the location of the refractive index probe is selected from the group consisting of: into a feed going into a desalting unit, into a heat exchanger, into a preheater, and combinations thereof;

further comprising avoiding inducing asphaltene fouling using the SBn by implementing a change to the blending, based upon the determination of crude oil stability, by changing a unit residence time.

12. The method of claim 11 further comprising

periodically determining the accuracy of the SBn determination using a turbidimetric flocculation titration method as a check on accuracy;

making an Asphaltene Stability Index determination for crude oil at or near the point of the refractive index probe location; and

correlating SBn determined using the refractive index probe with the ASI determination;

using the correlated SBn to adjusting the order of blending of feed streams to improve crude oil stability of a combined feed stream.

13. The method of claim **12** wherein the two or more crude oil streams are a heavy crude oil stream and a shale oil stream.

14. The method of claim **12** further comprising monitoring the Asphaltene Stability Index using only the RI data.