Claims

1. A method for separating oil and water from an oil/water emulsion by agglomerating oil droplets and/or water droplets to form larger drops in each case, and by phase separation between oil and water under gravitational forces, characterized in that, to agglomerate oil droplets and/or water droplets, the oil/water emulsion is mixed with functional solid particles, wherein the functional solid particles are hydrophobized for the agglomeration of oil droplets or hydrophilized for the agglomeration of water droplets.

2. The method as claimed in claim 1, characterized in that the functional solid particles are magnetic or magnetizable.

3. The method as claimed in claim 1 or 2, characterized in that the functional solid particles consist of magnetite or silicon dioxide.

4. The method as claimed in one of the preceding claims, characterized in that hydrophobic and hydrophilic functional solid particles are simultaneously introduced, so that both a magnetizable oil-rich suspension and a magnetizable water-rich suspension are formed which have sharp phase boundaries between them.

5. The method as claimed in one of the preceding claims, characterized in that phase separation is increased by mixing the oil/water emulsion with functional solid particles to produce agglomerates of oil droplets and/or water droplets.

6. The method as claimed in one of the preceding claims, characterized in that phase separation is increased by placing a suspension consisting of an oil/magnetite phase or a water/magnetite phase, and resulting from single or multiple precipitation, in a magnetic field.

7. The method as claimed in one of the preceding claims, characterized in that the separation of magnetic functional solid particles from the oil or water takes place in a magnetic separator.

8. The method as claimed in one of the preceding claims, characterized in that separating off a water component after phase separation simultaneously results in the removal of dissolved mineral substances, as these preferably separate in the water.

9. The method as claimed in one of the preceding claims, characterized in that the respective agglomerate is densified by a gravity method.

10. The method as claimed in one of the preceding claims, characterized in that separating off a water component after phase separation is simultaneously used to remove dissolved mineral substances which preferably dissolve in the water.

11. The method as claimed in claim 10, characterized in that the mineral substances are sulfides or chlorides, for example.

12. The method as claimed in one of the preceding claims, characterized in that the functional solid particles are

separated off after being used to separate an emulsion from the resulting suspension and are then recycled.

13. The method as claimed in one of the preceding claims, characterized in that non-magnetic or only weakly magnetic functional solid particles are used and a gravity method is used to produce a pure phase in order to densify the respective agglomerates to the extent that the pure phases combine through contact of droplets to produce larger agglomerates.

14. A device for separating oil and/or water from an oil/water emulsion, comprising at least one magnetic separator having a moving magnetic field.

15. The apparatus as claimed in claim 14,
which comprises at least one magnetic separator having an electromagnetically generated moving field.

16. The apparatus as claimed in one of claims 14 or 15,
which comprises at least one magnetic separator such as a magnetic drum separator, belt separator or high-field or high-gradient separator.

Claims

1. A method for separating oil and water from an oil/water emulsion by agglomerating oil droplets and/or water droplets to form larger drops in each case, and by phase separation between oil and water under gravitational forces, characterized in that, to agglomerate oil droplets and/or water droplets, the oil/water emulsion is mixed with functional solid particles, wherein the functional solid particles are hydrophobized for the agglomeration of oil droplets or hydrophilized for the agglomeration of water droplets, and hydrophobic and hydrophilic functional solid particles are simultaneously introduced, so that both a magnetizable oil-rich suspension and a magnetizable water-rich suspension are formed which have sharp phase boundaries between them.

2. The method as claimed in claim 1, characterized in that the functional solid particles are magnetic or magnetizable.

3. The method as claimed in claim 1 or 2, characterized in that the functional solid particles consist of magnetite or silicon dioxide.

4. The method as claimed in one of the preceding claims, characterized in that phase separation is increased by mixing the oil/water emulsion with functional solid particles to produce agglomerates of oil droplets and/or water droplets.

5. The method as claimed in one of the preceding claims, characterized in that phase separation is increased by placing the magnetizable oil-rich suspension consisting of an oil/magnetite phase or the magnetizable water-rich suspension

consisting of a water/magnetite phase, and resulting from single or multiple precipitation, in a magnetic field.

6. The method as claimed in one of the preceding claims, characterized in that the separation of magnetic functional solid particles from the oil or water takes place in a magnetic separator.

7. The method as claimed in one of the preceding claims, wherein the oil/water emulsion further comprises dissolved mineral substances and said method is characterized in that said dissolved mineral substances are simultaneously removed when separating off the water component after phase separation as said dissolved mineral substances preferably separate in the water.

8. The method as claimed in one of the preceding claims, characterized in that the respective agglomerate is densified by a gravity method.

9. The method as claimed in claim 7 wherein the dissolved mineral substances are dissolved in the water component.

10. The method as claimed in claim 9, characterized in that the mineral substances are sulfides or chlorides.

11. The method as claimed in one of the preceding claims, characterized in that the functional solid particles are separated off after being used to separate an emulsion from the resulting suspension and are then recycled.

12. The method as claimed in one of the preceding claims, characterized in that non-magnetic or only weakly magnetic functional solid particles are used and a gravity method is

used to produce a pure phase in order to densify the respective agglomerates to the extent that the pure phases combine through contact of droplets to produce larger agglomerates.

13. A method as claimed in one of the preceding claims wherein a magnetic separator having a moving magnetic field is used to separate the oil and/or water from the oil/water emulsion.

14. The method as claimed in claim 13,
wherein the moving magnetic field is electromagnetically generated.

15. The method as claimed in one of claims 13 or 14,
wherein the magnetic separator is one of a magnetic drum separator, belt separator or high-field or high-gradient separator.