

Claims

1. Process for hydroformylation of olefins having 6 to 20 carbon atoms in the presence of a cobalt catalyst in the presence of an aqueous phase with thorough mixing in a reactor
5 wherein a hydroformylation products-containing first stream is withdrawn at the top of the reactor and an aqueous phase-containing second stream is withdrawn from the bottom of the reactor via at least one line leading out of the bottom of the reactor, which process comprises controlling one or more mass flow parameters of the second stream in accordance with the density of the second stream.
- 10 2. Process according to claim 1, wherein the density of the second stream is measured in the line leading out of the bottom of the reactor.
- 15 3. Process according to claim 1 or claim 2, wherein one or more mass flow parameters are the mass flow, the mass flow rate or any other parameter determined on the basis of the mass flow and/or the mass flow rate.
- 20 4. Process according to any of the claims 1 to 3, comprising measuring the density of the second stream to determine one or more controlled variables on basis of the measured density, comparing the one or more controlled variables with one or more reference values to determine one or more controlling quantities and using the one or more controlling quantities to determine one or more actuating signals to control the one or more mass flow parameters of the second stream.
- 25 5. Process according to any of the claims 1 to 4, wherein the density is measured by one or more Coriolis mass flow meters.
- 30 6. Process according to any of the claims 1 to 5, wherein the measured density of the second stream is compared with a predefined reference value for the density of the second stream and the mass flow and/or the mass flow rate of the second is increased if the measured density of the second stream is above the predefined reference value for the density of the second stream.
- 35 7. Process according to any of the claims 1 to 6, wherein the measured density of the second stream is compared with a predefined reference value for the density of the second stream and the mass flow and/or the mass flow rate of the second stream is decreased if

the measured density of the second stream is below the predefined reference value for the density of the second stream.

- 5 8. Process according to any of the claims 1 to 7, wherein the density of the second stream is measured at at least one point in the line leading out of the bottom of the reactor.
9. Process according to any of the claims 1 to 8, wherein the first stream and the second stream are passed into a post-reactor.
- 10 10. Process according to claim 9, wherein a hydroformylation products containing first stream is withdrawn at the top of the post-reactor and an aqueous phase-containing second stream is withdrawn from the bottom of the post-reactor.
- 15 11. Process according to claim 10, wherein the one or more mass flow parameters of the second stream withdrawn from the bottom of the post-reactor via at least one line leading out of the bottom of the post-reactor is controlled in accordance with the density of the second stream.
- 20 12. Process according to any of the claims 1 to 11, wherein the first stream and second stream, withdrawn from the reactor or in case a post-reactor is in place withdrawn from the post-reactor, are subjected in the presence of aqueous cobalt(II) salt solution to oxygen treatment wherein the cobalt catalyst decomposes to form cobalt(II) salts which are extracted into the aqueous phase and the phases are then separated.
- 25 13. Process according to claim 12, wherein the water content in the reactor, in case a post-reactor is used in the post-reactor and in the phase separation is controlled by means of dynamic decoupling.
- 30 14. Process according to any of the claims 1 to 13, wherein the temperature in the reactor is from 100 to 250 °C and in case a post-reactor is used, the temperature in the post-reactor is from 100 to 250° C.
- 35 15. Process according to any of the claims 1 to 14, wherein the prevailing pressure in the reactor is from 100 to 400 bar abs and in case a post-reactor is used, the prevailing pressure in the post-reactor is from 100 to 400 bar abs.