Claims

1. A process for producing an aldehyde, the process comprising:

hydroformylating an olefin to form the aldehyde using a hydroformylation catalyst;

recovering an effluent stream comprising the aldehyde, hydrogen and the hydroformylation catalyst;

passing the effluent stream to a stripper; contacting the effluent stream with a strip gas in the stripper to produce a stripped effluent stream having a lower hydrogen concentration than the effluent stream; and

recovering the stripped effluent stream,

wherein the strip gas comprises carbon monoxide, wherein the process comprises: feeding a syngas stream to a separation system; separating the syngas stream into a hydrogen rich stream and a carbon monoxide rich stream in the separation system; and using the carbon monoxide rich stream as the strip gas.

2. A process according to claim 1, wherein the separation system comprises a membrane or a cryogenic distillation unit.

3. A process according to claim 1 or claim 2, wherein the process comprises: recovering a used strip gas stream, comprising the strip gas and hydrogen, from the stripper; combining the used strip gas stream with the hydrogen rich stream to form a recombined syngas stream;

and feeding the recombined syngas stream to the hydroformylation section.

4. A process according to any of claims 1 to 3, wherein the process comprises splitting the syngas stream fed to the separation system from a syngas feed stream to the hydroformylation section.

5. A process according to claim 4 when dependent on claim 5, wherein the recombined syngas stream is fed to the hydroformylation section by mixing the recombined syngas stream with the syngas feed stream.

6. A process according to any preceding claim wherein the hydroformylation catalyst comprises a homogenous metal-ligand catalyst.

7. A process according to claim 6, wherein the homogeneous metal-ligand catalyst comprises rhodium.

8. A process according to claim 6 or 7, wherein the metal-ligand catalyst comprises an organophosphite or organophosphine ligand.

9. A process according to claim 8, wherein the organophosphite or organophosphine ligand comprises Normax or triphenylphosphine.

10. A process according to any preceding claim, wherein the process comprises feeding the stripped effluent stream to a vaporiser and recovering from the vaporiser a vapour stream comprising: (1) the aldehyde, and (2) a liquid catalyst recycle stream comprising the

hydroformylation catalyst for recycle to the hydroformylation section.

11. A process according to claim 10, wherein the molar composition of hydrogen in the stripped effluent stream is not more than 5 mol%.

12. A process according to claim 10 or 11, wherein the process comprises feeding a gas comprising carbon monoxide to the vaporiser.