Claims.

1. A process for removing heavy metals from process fluids comprising passing a heavy-metal-containing process fluid, comprising a reductant selected from hydrogen and carbon monoxide, at an inlet temperature ≤ 125°C over a sorbent in the form of extrudates or granules comprising
   (i) 4-75% by weight of one or more sulphided powdered copper compounds selected from sulphided basic copper carbonate, sulphided copper hydroxide, sulphided copper oxide or mixtures of these,
   (ii) optionally a powdered support material, and
   (iii) a binder and the binder content of the sorbent is in the range 5-30% by weight,
   wherein essentially all of the sulphided copper is in the form of CuS and the total metal sulphide content of the sorbent, other than copper sulphide, is ≤ 5% wt.

2. A process according to claim 1 wherein the sorbent comprises a support material selected from the group consisting of alumina, hydrated alumina, titania, zirconia, silica or aluminosilicate, or a mixture of two or more of these.

3. A process according to claim 1 or claim 2 wherein the sorbent comprises a first binder and a second binder, wherein the first binder is a cement binder and the second binder is a high aspect ratio binder having an aspect ratio >2.

4. A process according to claim 3wherein the first binder is a calcium aluminate cement binder.

5. A process according to claim 3 or claim 4 wherein the second binder is an aluminosilicate clay.

6. A process according to any one of claims 3 to 5 wherein the relative amounts of the first and second binder are in the range 1:1 to 3:1 (first to second binder).

7. A process according to any one of claims 1 to 6 wherein the total metal sulphide content of the sorbent, other than copper sulphide, is ≤ 0.1% wt, preferably ≤ 0.5% wt.

8. A process according to any one of claims 1 to 7 wherein the density of the sorbent, expressed as the sulphur density, is in the range 50 to 200 kg S/m^3.

9. A process according to any one of claims 1 to 8 wherein the process fluid is a liquid hydrocarbon stream containing dissolved hydrogen and/or carbon monoxide.

10. A process according to any one of claims 1 to 8 wherein the process fluid is a gaseous stream containing hydrogen and/or carbon monoxide.

11. A process according to claim 10 wherein the gaseous stream comprises a reductant in the range 1-100% by volume, preferably 5-95%, more preferably either 1-49% vol or 50-95% vol.

12. A process according to claim 10 wherein the process fluid is a synthesis gas stream.

13. A process according to claim 10 wherein the process fluid is selected from a refinery vent stream, a refinery cracker stream, a blast furnace gas, a reducing gas, and a hydrogen-rich gas stream,

14. A process according to any one of claims 1 to 13 wherein the process fluid inlet temperature is $\leq 95^{\circ}C$.

15. A process according to any one of claims 1 to 14 wherein the process fluid further comprises water in the range 0.02 to 1% vol.

Claims.

1. A process for removing heavy metals from process fluids comprising passing a heavy-metal-containing process fluid, comprising a reductant selected from hydrogen and carbon monoxide, at an inlet temperature ≤ 125°C over a sorbent in the form of extrudates or granules comprising
   (i) 4-75% by weight of one or more sulphided powdered copper compounds selected from sulphided basic copper carbonate, sulphided copper hydroxide, sulphided copper oxide or mixtures of these,
   (ii) optionally a powdered support material, and
   (iii) a binder and the binder content of the sorbent is in the range 5-30% by weight,
   wherein >90% wt of the copper present in the sorbent is sulphided, essentially all of the sulphided copper is in the form of CuS and the total metal sulphide content of the sorbent, other than copper sulphide, is ≤ 5% wt.

2. A process according to claim 1 wherein the sorbent comprises a support material selected from the group consisting of alumina, hydrated alumina, titania, zirconia, silica or aluminosilicate, or a mixture of two or more of these.

3. A process according to claim 1 or claim 2 wherein the sorbent comprises a first binder and a second binder, wherein the first binder is a cement binder and the second binder is a high aspect ratio binder having an aspect ratio >2.

4. A process according to claim 3 wherein the first binder is a calcium aluminate cement binder.

5. A process according to claim 3 or claim 4 wherein the second binder is an aluminosilicate clay.

6. A process according to any one of claims 3 to 5 wherein the relative amounts of the first and second binder are in the range 1:1 to 3:1 (first to second binder).

7. A process according to any one of claims 1 to 6 wherein the total metal sulphide content of the sorbent, other than copper sulphide, is ≤ 0.1% wt, preferably ≤ 0.5% wt.

8. A process according to any one of claims 1 to 7 wherein the density of the sorbent, expressed as the sulphur density, is in the range 50 to 200 kg S/m^3.

9. A process according to any one of claims 1 to 8 wherein the process fluid is a liquid hydrocarbon stream containing dissolved hydrogen and/or carbon monoxide.

10. A process according to any one of claims 1 to 8 wherein the process fluid is a gaseous stream containing hydrogen and/or carbon monoxide.

11. A process according to claim 10 wherein the gaseous stream comprises a reductant in the range 1-100% by volume, preferably 5-95%, more preferably either 1-49% vol or 50-95% vol.

12. A process according to claim 10 wherein the process fluid is a synthesis gas stream.

13. A process according to claim 10 wherein the process fluid is selected from a refinery vent stream, a refinery cracker stream, a blast furnace gas, a reducing gas, and a hydrogen-rich gas stream,

14. A process according to any one of claims 1 to 13 wherein the process fluid inlet temperature is $\leq 95^{\circ}C$.

15. A process according to any one of claims 1 to 14 wherein the process fluid further comprises water in the range 0.02 to 1% vol.