

CLAIMS

1. Method of producing an electrocatalyst, comprising the steps of:
 - a) electrodeposition or electrochemical plating of an alloy comprising nickel and a second metal on a copper, nickel or other metal substrate; and
 - 5 b) electrochemical or chemical dissolution of deposited second metal to obtain a nanoporous structure on the copper, nickel or other metal substrate.
2. The method of claim 1, wherein the second metal is copper or iron.
3. The method of claim 2, wherein the second metal is copper and the
10 method further comprises the step of:
 - c) deposition of iron on the porous structure.
4. The method of claim 2, wherein the second metal is iron and the method further comprises the step of:
 - c) deposition of copper on the porous structure.
- 15 5. The method of claim 1 or 2, wherein the alloy of step a) further comprises a third metal, such as copper or iron, which third metal is different from the second metal.
6. The method of any of the preceding claims, wherein the second metal is copper and an electroplating solution comprising a copper salt, such
20 as CuSO_4 , and a nickel salt, such as NiSO_4 , is used in step a).
7. The method of claim 6, wherein the molar ratio of copper to nickel in the electroplating solution is between 1:1 and 1:3, such as between 1:1.5 and 1:2.5, such as between 1:1.8 and 1:2.2.
8. The method of any one of the preceding claims, wherein a voltage
25 of 2-6 V in a two electrodes setup is applied in step a).

9. The method of any one of the preceding claims, wherein a solution comprising sulphate ions, such as a K_2SO_4 solution, an alkaline solution or an acidic solution is used in step b).

10. The method of any one of the preceding claims, wherein a voltage
5 of 1-12 V, such as 2-3 V, is applied in step b) in a two electrodes setup.

11. The method of any one of the preceding claims, wherein a pulsed voltage is applied in step b).

12. The method of claim 3 or 4, wherein step c) is an electrodeposition.

10 13. The method of claim 3, further comprising the step of d) passivating the deposited iron.

14. The method of any one of the preceding claims, wherein the copper substrate comprises a copper coil.

15 15. The method if any of the preceding claims, wherein the said other metal is one of iron, cobalt, titanium, zirconium, stainless steel and aluminium.

16. The method of any one of the preceding claims, wherein the copper or nickel substrate is a porous copper or nickel substrate.

17. Electrocatalyst obtainable by the method of any of claims 1-16.