## CLAIMS

1. A substantially continuous process for forming gold nanocrystals in at least one liquid comprising:

flowing at least one liquid through at least one trough member, said at least one liquid having an upper surface and a flow direction, and said at least one flowing liquid further comprising at least one processing enhancer;

providing at least one first electrode control device containing at least one first set of metallic-based electrodes comprising gold, said at least one first set of electrodes comprising gold in contact with said at least one flowing liquid;

providing at least one second electrode control device containing at least one second set of electrodes comprising gold, said at least one second set of electrodes comprising gold also in contact with said at least one flowing liquid and located downstream in said flow direction from said at least one first electrode control device containing said at least one first set of electrodes comprising gold; and

conducting at least one electrochemical reaction at said at least one first set of electrodes comprising gold and at said at least one second set of electrodes comprising gold thereby producing at least some gold nanocrystals within said at least one liquid.

2. The process of claim 1, wherein said at least one trough member comprises a conduit with at least one inlet and at least one outlet which permits said at least one liquid to flow therein.

3. The process of claim 1, wherein said at least one processing enhancer comprises at least one material from the group consisting of $NaHCO_3$, $Na_2CO_3$, $K_2CO_3$ and $KHCO_3$.

4. The process of claim 1, wherein said at least one first set of electrodes comprising gold comprise the shape of wires.

5. The process of claim 1, wherein a plurality of said at least one second electrode control device is provided in addition to said first electrode control device wherein each of said second electrode control device contains a second set of electrodes comprising gold and each of which second sets contact said at least one liquid to cause said at least one electrochemical reaction to occur thus creating at least some gold nanocrystals in said at least one liquid.

6. The process of claim 5, wherein at least one power source is provided between each of said second sets of electrodes comprising gold to cause said at least one electrochemical reaction to occur.

7. The process of claim 1, wherein each of said first electrode control device and each of said second electrode control device adjusts the location of each of said at least one first set of electrodes comprising gold and each of said at least one second set of electrodes comprising gold by raising or lowering at least one of the electrodes of said first and second set of electrodes comprising gold relative to the upper surface of said at least one liquid.

8. The process of claim 1, wherein said at least one liquid comprises water.

9. The process of claim 1, wherein said processing enhancer comprises $NaHCO_3$

10. The process of claim 1, wherein said at least one first set of electrodes comprising gold is present with six sets of said at least one second set of electrode sets comprising gold.

11. The process of claim 1, wherein at least five sets of electrodes comprising gold are provided.

12. The process of claim 1, wherein said processing enhancer comprises $Na_2CO_3$.

13. The process of claim 1, wherein each of said first electrode control device and said second electrode control device comprises step motors having wheel-shaped components in electrical contact with each of said electrodes comprising gold.

14. The process of claim 1, wherein said at least one set of electrodes comprising gold are in the shape of wires.

15. The process of claim 14, wherein said gold wires are moveable in said flowing water by at least one electrode control device.

16, The process of claim 15, wherein said gold wires have a diameter which comprises at least one size selected from the group of sizes consisting of about 0.5 mm and about 1.0 mm.

17. The process of claim 16, wherein said at least one electrode control device causes said at least one first set of electrodes comprising gold and said at least one second set of electrodes comprising gold to operate at a voltage of about 250 volts to about 946 volts.

18. The process of claim 17, wherein said at least one liquid is pumped through said at least one trough member, said at least one trough member having an inlet portion and an outlet portion.

19. A device for substantially continuously forming at least some gold nanocrystals in at least one flowing liquid having a flow direction comprising:

at least one trough member;

at least one first set of electrodes comprising gold for conducting at least one electrochemical reaction;

at least one second set of electrodes comprising gold for conducting at least one electrochemical reaction located downstream in said flow direction from said at least one first set of electrodes comprising gold; and

at least one power source connected to each of said at least one first set of electrodes comprising gold and said at least one second set of electrodes comprising gold for conducting said at least one electrochemical reaction thereby providing said at least some nanocrystals comprising gold.

20. The device of claim 19, wherein said at least one first set of electrodes comprising gold are housed in at least one first electrode control device.

21. The device of claim 19, wherein said at least one second set of electrodes comprising gold are housed in at least one second electrode control device.