Claims

1. A stacked arrangement comprising:
   a metal electrode layer comprising a first material;
   a piezoelectric layer; and
   a metal buffer layer having a first surface in contact with the metal electrode layer and a second surface, the second surface opposite the first surface, in contact with the piezoelectric layer;
   wherein the metal buffer layer comprises a second material different from the first material; and
   wherein an average grain size of grains of the metal buffer layer is greater than an average grain size of grains of the metal electrode layer.

2. The stacked arrangement according to claim 1,
   wherein the average grain size of the grains of the metal buffer layer is two times or more than the average grain size of the grains of the metal electrode layer.

3. The stacked arrangement according to claim 1,
   wherein the average grain size of the grains of the metal buffer layer is greater than 40 nm.

4. The stacked arrangement according to claim 1,
   wherein the average grain size of the grains of the metal buffer layer is greater than 70 nm.

5. The stacked arrangement according to claim 1,
   wherein a surface energy of the metal buffer layer is lower than a surface energy of the metal electrode layer.

6. The stacked arrangement according to claim 1,
   wherein the metal buffer layer has a surface energy lower than or equal to 1.5 J/m^2.

7. The stacked arrangement according to claim 1,
wherein the metal buffer layer comprises aluminum (Al), silver (Ag) or zirconium (Zr).

8. The stacked arrangement according to claim 1,
wherein the metal electrode layer comprises molybdenum (Mo), ruthenium (Ru) or tungsten (W).

9. The stacked arrangement according to claim 1,
wherein the piezoelectric layer comprises aluminum nitride or a rare earth element doped aluminum nitride.

10. A micro-electromechanical systems (MEMS) device comprising:
a metal electrode layer comprising a first material;
a piezoelectric layer;
a metal buffer layer having a first surface in contact with the metal electrode layer and a second surface, the second surface opposite the first surface, in contact with the piezoelectric layer; and
a further metal electrode layer such that the piezoelectric layer is between the metal electrode layer and the further metal electrode layer;
wherein the metal buffer layer comprises a second material different from the first material; and
wherein an average grain size of grains of the metal buffer layer is greater than an average grain size of grains of the metal electrode layer.

11. A method of forming a stacked arrangement, the method comprising:
forming a metal electrode layer comprising a first material;
forming a piezoelectric layer; and
forming a metal buffer layer having a first surface in contact with the metal electrode layer and a second surface, the second surface opposite the first surface, in contact with the piezoelectric layer;
wherein the metal buffer layer comprises a second material different from the first material; and
wherein an average grain size of grains of the metal buffer layer is greater than an average grain size of grains of the metal electrode layer.

12. The method according to claim 11,
wherein the average grain size of the grains of the metal buffer layer is two times or more than the average grain size of the grains of the metal electrode layer.

13. The method according to claim 11,
wherein the average grain size of the grains of the metal buffer layer is greater than 40 nm.

14. The method according to claim 11,
wherein the average grain size of the grains of the metal buffer layer is greater than 70 nm.

15. The method according to claim 11,
wherein a surface energy of the metal buffer layer is lower than a surface energy of the metal electrode layer.

16. The method according to claim 11,
wherein the metal buffer layer has a surface energy lower than or equal to 1.5 J/m^2.

17. The method according to claim 11,
wherein the metal buffer layer comprises aluminum (Al), silver (Ag) or zirconium (Zr).

18. The method according to claim 11,
wherein the metal electrode layer comprises molybdenum (Mo), ruthenium (Ru) or tungsten (W).

19. The method according to claim 11,
wherein the piezoelectric layer comprises aluminum nitride or a rare earth element doped aluminum nitride.

20. A method of forming a micro-electromechanical systems (MEMS) device, the method comprising:

forming a metal electrode layer comprising a first material;

forming a piezoelectric layer;

forming a metal buffer layer having a first surface in contact with the metal electrode layer and a second surface, the second surface opposite the first surface, in contact with the piezoelectric layer; and

forming a further metal electrode layer such that the piezoelectric layer is between the metal electrode layer and the further metal electrode layer;

wherein the metal buffer layer comprises a second material different from the first material; and

wherein an average grain size of grains of the metal buffer layer is greater than an average grain size of grains of the metal electrode layer.