~~Claims:~~

CLAIMS

1. A method of reducing the formation of insoluble deposits in semiconductor electrochemical plating equipment or a surface thereof during electrochemical plating, the method comprising:

removing electrochemical plating equipment or a surface thereof from an electroplating solution, wherein residual electroplating solution is disposed atop the electrochemical plating equipment or a surface thereof, and wherein the residual electroplating solution has a first pH;

contacting the residual electroplating solution with a rinse agent having a second pH similar to the first pH to form a rinsate, wherein the rinse agent is a mineral acid; and

removing the rinsate from the electrochemical plating equipment or a surface thereof.

2. The method of claim 1, wherein the first pH is substantially similar to the second pH.

3. The method of claim 1, wherein the first pH is ~~2~~equal to ~~5, and~~ the second pH ~~is 2 to 5~~.

4. The method of claim 1, wherein the ~~rinse agent is a mineral acid~~first pH is 2 to 5, and the second pH is 2 to 5.

5. The method of claim 1, wherein the first pH is 8 to 10, and the second pH is 8 to 10.

6. The method of claim 1, wherein the rinse agent is applied under conditions sufficient to prevent precipitation of organometallic or metallic precursors from the rinsate.

7. The method of claim 1, wherein the rinse agent is applied under conditions that maintain the pH of the residual electroplating solution.

8. The method of claim 1, wherein contacting the rinse agent with the residual electroplating solution causes a reduction of the formation of insoluble deposits in semiconductor electrochemical plating equipment or a surface thereof.

9. The method of claim 1, wherein the surface is disposed upon a seal.

10. A method of reducing or eliminating the formation of conductive deposits on surfaces in an electrochemical plating equipment, comprising contacting an acidic rinse agent with one or more surfaces comprising electrolyte to form an acidic rinsate; and flowing the acidic rinsate away from the one or more surfaces~~.~~, wherein the electrolyte has a first pH substantially similar to the acidic rinse agent, wherein the electrolyte has a pH of 2 to 5, and the acidic rinse agent has a pH of 2 to 5, and wherein the acidic rinse agent is a mineral acid.

11. The method of claim 10, wherein the electrolyte has a first pH equal to the acidic rinse agent.

12. The method of claim 10, wherein the ~~electrolyte has a pH of 2 to 5, and the~~ acidic rinse agent ~~has a pH of 2 to 5~~comprises carbonic acid.

13. The method of claim 10, ~~wherein the acidic rinse agent is carbonic acid, and~~

wherein the acidic rinse agent is applied under conditions sufficient to prevent precipitation of organometallic or metallic precursors from the acidic rinsate.

14. The method of claim 10, wherein the acidic rinse agent is applied under conditions that maintain the pH of the electrolyte.

15. The method of claim 10, wherein contacting the acidic rinse agent with the electrolyte causes a reduction of the formation of insoluble deposits in semiconductor electrochemical plating equipment or a surface thereof.

~~15~~16. The method of claim ~~14~~15, wherein the surface is disposed upon a seal.

17. A method of reducing the formation of insoluble deposits in semiconductor electrochemical plating equipment or a surface thereof during electrochemical plating, the method comprising:

removing electrochemical plating equipment or a surface thereof from an electroplating solution, wherein residual electroplating solution is disposed atop the electrochemical plating equipment or a surface thereof, and wherein the residual electroplating solution has a first pH;

contacting the residual electroplating solution with a rinse agent having a second pH similar to the first pH to form a rinsate; and

removing the rinsate from the electrochemical plating equipment or a surface thereof.

18. The method of claim 17, wherein the first pH is substantially similar to the second pH.

19. The method of claim 17, wherein the first pH is 2 to 5, and the second pH is 2 to 5.

20. The method of claim 17, wherein the rinse agent is an organic acid.

21. The method of claim 17, wherein the rinse agent is an alkylsulfonic acid.

22. The method of claim 17, wherein the rinse agent is methane sulfonic acid.

23. The method of claim 17, wherein the rinse agent is applied under conditions sufficient to prevent precipitation of organometallic or metallic precursors from the rinsate.

24. The method of claim 17, wherein the rinse agent is applied under conditions that maintain the pH of the residual electroplating solution.

25. The method of claim 17, wherein contacting the rinse agent with the residual electroplating solution causes a reduction of the formation of insoluble deposits in semiconductor electrochemical plating equipment or a surface thereof.

26. The method of claim 17, wherein the surface is disposed upon a seal.

27. A method of reducing or eliminating the formation of conductive deposits on surfaces in an electrochemical plating equipment, comprising contacting an acidic rinse agent with one or more surfaces comprising electrolyte to form an acidic rinsate; and flowing the acidic rinsate away from the one or more surfaces.

28. The method of claim 27, wherein the electrolyte has a first pH is substantially similar to the acidic rinse agent.

29. The method of claim 27, wherein the electrolyte has a pH of 2 to 5, and the acidic rinse agent has a pH of 2 to 5.

30. The method of claim 27, wherein the acidic rinse agent is an organic acid.

31. The method of claim 27, wherein the acidic rinse agent is an alkylsulfonic acid.

32. The method of claim 27, wherein the acidic rinse agent is methane sulfonic acid.

33. The method of claim 27, wherein the acidic rinse agent is applied under conditions sufficient to prevent precipitation of organometallic or metallic precursors from the acidic rinsate.

34. The method of claim 27, wherein the acidic rinse agent is applied under conditions that maintain a pH of the electrolyte.

35. The method of claim 27, wherein contacting the acidic rinse agent with the electrolyte causes a reduction of the formation of insoluble deposits in semiconductor electrochemical plating equipment or a surface thereof.

36. The method of claim 35, wherein the surface is disposed upon a seal.