

How to make a good a nano coating of copper

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This is my understanding of how to make a good a nano coating of copper:

1. Use oxygen free electric copper if possible. c.0.8-1mm thick.
2. Have the surface of the copper shiny.
3. Clean the surface of the copper to be free of oxidation, oil, fingerprints etc,
4. Choose a polypropylene plastic box with lid for the coating process.
5. Place on the bottom of the dry container caustic soda (NaOH) of higher purity, mixed with some KOH or KCl salt. The presence of potassium (K) is important, as potassium contains 120 ppm (0.012%) of K40 isotope, which is subject to beta decay, and it helps to trigger the process. NOTE: I used to get good results with 40 grams of NaOH and 12-15 grams of KOH per liter of boiling water.
6. Place a zinc coated iron mesh (chicken wire) over the caustic, with purpose to create a distance between the bottom of the container and the pieces, which are to be nano-coated.
7. Position the copper pieces onto the chicken mesh. Alternatively, you may hang them on any kind of suitable support, which keep them separated (not touching each other and not touching the bottom of the container).
8. As a basic rule, do not stack the pieces of copper one over the other, and do not tamper them from here on. You have to minimize the contact with them (for example by holding them by the edges, with extreme care to not damage or crush the created nano-layers).
9. Prepare enough boiling water to be able to cover in an instant all the copper pieces.
10. Put the lid on the container, then move it slightly in order to crack-open just a corner of it, through which opening you will be able to pour the boiling water in. Avoid that the vapours to reach your face and avoid breathing in the vapours. Use face and eye protection, gloves, protective equipment as described in the MSDS.
11. Pour the boiling water into the container and cover it with the lid immediately. You can place a weight over the lid of necessary in order to close it well. Leave it untouched for at least 48 hours, and better for one week.

12. After 2-7 days passed, remove the lid and drain the liquid caustic from the container. Do not move the copper pieces, do not touch them, just remove the caustic liquid. You can use a flexible pipe for siphoning (similarly to how fish-tanks are emptied).

13. the plates shouldn't change colour whilst in the caustic, only once removed to develop in the closed tub.

14. Leave a little liquid (about 1-3 ml) in the container in order to provide moisture.

15. Immediately after the removal of the liquid caustic, apply the probes of a millivoltmeter to two extremities of the copper pieces for about 5- 10 seconds, with purpose to polarize the surface and dictate a direction of the formation of the nano-structures. Optionally, you can repeat this 4-5 times a day, depending on purpose. In case of nano-coating wires or coils, apply the probes on the ends of the wires. In case of plates, it is preferable to apply on diagonally opposed corners of the plates.

16. Place back the lid on the top of the container, and leave it for minimum 2 weeks, and preferably for 2 months for the nano-layers to grow.

17. Optionally, you may do a second coating without immersion, but with steaming over caustic steam, followed again by polarizing and conditioning in the same way as after the immersion process.

18. When you decide to end the process, do not immediately open the containers. First open a little crack for allow the moisture to evaporate gradually during a couple of days. The transition from moist environment to room environment has to be done gradually.

19. Once the process done, rinse the nano-coated copper pieces with distilled water in order to remove the caustic from their surface.

20. Before use, keep the nano coated pieces in closed boxes. And handle with great care and respect.