The following Patina Formulas are but a sampling of the thousands in existence. The formulas selected illustrate a wide range of application methods and rich variety of colors. The author makes no warranties either expressed or implied with respect to the color, reliability, or safety created through the use of these formulas.

PATINA FORMULAS FOR BRASS, BRONZE AND COPPER

1. LIGHT TO DARK-BROWN (BASIC BROWN) (Clarke with variations\(^1\))
   Ferric Nitrate ........................................... 1-4 tablespoons
   Water .......................................................... 1 pint
   * A hot process patina which produces a gold to brown color. A fresh mixture is necessary for each coloring. A preservative is optional.

2. MATTE BROWN (Rich)
   Barium Sulfide .................................................. 1 ounce
   Potash (Sulfated) ............................................. ¼ ounce
   Ammonia (Household solution without detergent) .................. 2 fluid ounces
   Water .......................................................... 3 to 5 quarts
   * An excellent cold process, opaque patina that darkens immediately after application. The matte color is best without a preservative, although you may use one.

3. YELLOW GREEN (Clarke)
   Ammonium Chloride ............................................... 7 parts by weight
   Copper Acetate .................................................. 4 parts by weight
   Water .......................................................... 8 parts by weight
   * A cold process, heavy opaque patina that takes effect after several applications. A preservative is optional.
4. RUST BROWN
(Payne with variations\textsuperscript{1})
Ferric Nitrate................................................................. 3 ounces
Ferric Chloride .................................................................. 2 ounces
Water ................................................................................ 1 to 3 quarts
*An excellent, cold process, opaque patina. It achieves immediate results. A preservative is not necessary.
*This patina produces corrosive fumes. Wear a respirator and work in a well ventilated area.*

5. BLUE
(Miller)
Sodium Thiosulfate .......................................................... 60 grams
Nitric Acid, 35% .............................................................. 2 teaspoons
Water ................................................................................ 1 quart
*A transparent, dip process patina. A preservative is necessary.
*This Patina is reported to produce a grey blue when tap water is used.*

6. LIGHT GREEN
(De Marco with variations\textsuperscript{1})
Ammonium Chloride ......................................................... 16 parts
Sodium Chloride .............................................................. 16 parts
Ammonium Hydroxide .................................................... 16 parts
*A cold process, opaque patina which can be applied time and time again. A preservative is optional. For a deeper green add 16 parts of Cupric Sulfate

7. BROWN TO BLACK
(Clarke)
Antimony Sulfide ............................................................ 2 parts
Sodium Hydroxide .......................................................... 4 parts
Water ................................................................................ 256 parts
*An excellent, hot process, semi-opaque patina. Color appears immediately after application. This patina can also be applied cold. A preservative is necessary.

8. BASIC BROWN TO BLACK
(Clarke)
Potash (Sulfurated) ......................................................... A grape size lump (crushed)
Water ................................................................................ 1 pint
*A transparent, hot or cold process patina. A preservative should be used.

9. SHIMMERING GREY
(Young with variations\textsuperscript{1})
Silver Nitrate ................................................................. 8 grams
Water ................................................................................ 1 pint
*This is a hot process patina. The hotter the piece, the greater the silver appearance. Reheating the piece and rubbing it with a 000 steel wool will raise the shimmering qualities of your sculpture. This patina works well as an undercoat or as an overcoat to almost any patina.
10. SILVER
Silver Nitrate .......................................................... 30 grams
Water........................................................................ 1 pint
*This is a **hot process** patina. The hotter the piece, the **greater** the silver appearance. **Reheating** the piece and rubbing it with a **000 steel wool** will raise the shimmering **qualities** of your sculpture. This **patina works well as an undercoat or as an overcoat to almost any patina.**

11. COBALT BLUE
(Mix #1)
Cupric Nitrate .......................................................... 125 grams
Cobalt Nitrate.............................................................. 85 grams
Water........................................................................ 1 gallon
(Mix #2)
Cupric Nitrate .......................................................... 250 grams
Water........................................................................ 1 gallon
*This is hot process patina. It is a semi-transparent, blue and black, marbled patina.
Mix solution #1 and solution #2 together in a one-to-one ratio. Spray combined solution over the heated metal. This recipe requires several applications (too many applications will result in the patina flaking). A preservative is necessary.

12. AQUA MARINE BLUE
(Cupric Nitrate .......................................................... 250 grams
Blue Dye
(Cerulean Blue) ................................................................ 2 ounces
**or**
(Methylene Blue) .......................................................... 2 grams
Water........................................................................ 1 gallon
*This is a hot process semi-transparent patina which is light aqua blue in color. It works well in combination with the other hot process blue and green patinas. A preservative is necessary.

13. BASIC GREEN
(Cupric Nitrate .......................................................... 1-4 tablespoons
Water........................................................................ 1 pint
*A hot process, semi-transparent patina.
14. PEACOCK BLUE
   (Krause with variations)  
   Sodium Thiosulfate ............................................................ 150 grams
   Lead Acetate ................................................................. 25 grams
   Potassium Bitartrate ...................................................... 30 grams
   Water .............................................................................. 1 liter
   *An intense, dip process, transparent patina. Immerse object for 20 to 30 minutes. A preservative should be applied immediately after the solution is removed and dried.

15. BASIC BLUE-BLACK
   (Clarke with variations)  
   Ammonium Sulfide ............................................................. 1 - 3 teaspoons
   Water .................................................................................. 1 pint
   *A hot or cold process, transparent patina. A preservative is optional. This is a nice fumed patina when used 2-4 tablespoons Ammonium Sulfide per pint of water. A preservative is necessary.

16. BLUE GREEN
   (Anonymous)  
   *Bronze object should be buried in sawdust, saturated with vinegar for several days. The sawdust should be left moist by reapplying the patina as necessary. This patina is opaque. A preservative is optional.

17. ANTIQUE WHITE
   (Soroka)  
   Bismuth Nitrate ................................................................. 2 teaspoons
   Water ............................................................................... 1 pint
   Potash (Sulfurated) ............................................................ A pinch
   *This is a semi-opaque, hot process patina. The object should be slightly oxidized with the torch before the solution is applied. Ferric Nitrate or Cupric Nitrate may be substituted for the Potash (Sulfurated), depending upon the effect desired. A preservative is necessary. The author has found that this patina is a poor substitute for the #29 white. You might like to try that patina instead.

18. BROWN
   (Clarke with variations)  
   Sodium Thiosulfate ............................................................ 1 part
   Ferric Nitrate ............................................................... 8 parts
   Water ............................................................................. 128 parts
   *An excellent cold process, semi-opaque patina. It works well with a preservative. The author has found this to be a very pleasing patina.
19. VERDE (Anonymous with variations)
   Cupric Sulfate ................................................................. 8 parts
   Ammonium Chloride .......................................................... 4 parts
   Sodium Chloride .............................................................. 4 parts
   Zinc Chloride ................................................................. 1 part
   Acetic Acid, Glacial .......................................................... 3 parts
   Water .............................................................................. 128 parts
   *This is a dip process patina, immerse object in solution for a few minutes, then remove. Repeat until a color appears. A preservative is optional. This patina produces more of a turquoise color than a green one. Color appears when removed from solution. A preservative is recommended.
   *It is OK to brush this patina solution on.*

20. METALLIC BLUE-BLACK (Anonymous)
   Barium Sulfide ...................................................................... 1 part
   Water .............................................................................. 128 parts
   *A dip process, semi-opaque patina, immerse object in solution overnight at normal temperature. A preservative is necessary.

21. WINE VINEGAR GREEN (De Marco)
   Red or White Wine Vinegar .................................................. 1 pint
   Water .............................................................................. 1 pint
   Ammonium Hydroxide ........................................................ 1 tablespoon
   Muriatic Acid ...................................................................... 1 tablespoon
   Sodium Chloride ................................................................. 1 teaspoon
   Ammonium Chloride .......................................................... 100 grams
   *An excellent, cold process, opaque patina. Apply solution for several days at 12 hour intervals. A preservative is optional.

22. APPLE GREEN (Anonymous)
   Sodium Chloride ................................................................... 5 parts
   Ammonia (Household solution without detergent) ................. 4 parts
   Ammonium Chloride .......................................................... 5 parts
   Acetic Acid, Glacial ............................................................ 4 parts
   Water .............................................................................. 4 parts
   *A cold process, heavy opaque patina. A preservative is optional.
23. TRANSPARENT BLACK
(Gadberry)
Gold Chloride Crystals .......................................................... ½ gram
Water ............................................................................... 100 ml
* Paint or spray one coat of this solution. Can also be used as a dip. A preservative is optional.

24. ANTIQUE GREEN
(Coleman with variations
Step #1
Do a hot process “Basic Green” patina (#13)
Step #2
While the piece is still hot apply a solution of:
Potassium Thiosulfate .............................................................. 2 ounces
Water ............................................................................... 1 quart
*This is a beautiful and versatile patina. Different results can be achieved by substituting Ferric Nitrate or Ferric Chloride for the Potassium Thiosulfate.

25. ROYAL BLUE
(Hess)
Cupric Sulfate ..................................................................... 8 parts
Ammonium Chloride .............................................................. 4 parts
Sodium Chloride .................................................................. 1 part
Acetic Acid, Glacial .............................................................. 3 parts
Water .................................................................................. 128 parts
*An excellent hot process semi-transparent patina. It works as a cold process as well.

26. WHITE
(Young)
Bismuth Nitrate ..................................................................... 3 ounces
Stannic Oxide ....................................................................... 1 ounce
Titanium Dioxide .................................................................. 1 ounce
Water .................................................................................. 24 ounces
*Mix the above ingredients and add 1-2 ounces colloidal silica. Let this solution rest for 3 days before using. This is a hot process patina. If you find more bite is necessary, add 5 or 6 drops of nitric acid.

27. NATURAL GREEN
(Anonymous with variations
Ammonium Chloride .............................................................. 8 parts
Cupric Sulfate ..................................................................... 8 parts
Water .................................................................................. 128 parts
*This is a cold process patina which needs a preservative if contact is expected. Works well with brown patinas.
*Reported to be dusty.*
*It is all right to vary chemical content to change the color slightly.*
28. SUNRISE COLORS  
(Haws with variations 1)
Dip #1
Sulfuric Acid........................................................................................................ 1 part
Water.................................................................................................................. Approximately 10 to 15 parts
Dip #2
Potash.................................................................................................................. 1 small lump
Water.................................................................................................................. Approximately 1 pint to 1 quart
*Dip or brush with dip #1 then dip in fresh water. Dip or brush with dip #2 then dip in fresh water. Continue until desired results are achieved. A preservative is necessary.

29. RUST BROWN/BLACK/RED  
(Anonymous/Rohan)
Step #1
Citric Acid........................................................................................................ 1-2 teaspoons
Water.................................................................................................................. 1 pint
Step #2
Rinse well with water.
Step #3
Potash.................................................................................................................. pea-sized lump
Water.................................................................................................................. 1-2 gallon
Step #4
Rinse well with water.
Steps 3 and 4 may be repeated until your desired results are achieved.
*This patina works very well to attain a red/brown heavily verigated patina. A preservative is necessary immediately after application.

30. GREEN  
(Anonymous/Rohan)
Sodium Thiosulfate............................................................................................ 4 ounces
Sulfuric Acid (1.84 sp. gr).................................................................................. 1.6 fluid ounces
Water.................................................................................................................. 1 gallon
*This is a cold process patina a preservative is recommended.

* All comments courtesy of T. B. Rohan, Patina Specialist.
1 All variations courtesy of T. B. Rohan, Patina Specialist.

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