

# Painting Safety

Source: <http://web.princeton.edu/sites/ehs/artsafety/sec10.htm>

The health hazards associated with painting and drawing have been known since Ramazzini described such illnesses 1713. Working safely can involve changes in how you select your art materials, and how you handle them. Paints are pigments mixed with a vehicle or binder. Both inorganic and organic pigments are used as colorants. Dry pigments are especially hazardous because they are easily inhaled and ingested.

## Pigments vs. Hues

Most paints used in Visual Arts do not contain metal pigments and are considered non-toxic. These are most easily identified by the product name. If the paint is described as *hue*, such as "chromium yellow hue", there is no (or too little to be concerned about) toxic metal contained in the product.

## Hazards

1. Poisoning can occur if toxic pigments are inhaled or ingested. The main hazard in standard painting techniques is accidental ingestion of pigments due to eating, drinking or smoking while working, inadvertent hand to mouth contact, or pointing the paint brush with the lips. If methods such as spraying, heating, or sanding are employed then there is an opportunity for inhalation of toxic pigments.
2. The classic example of a toxic inorganic pigment in painting is <sup>1</sup>white lead, or flake white (basic lead carbonate). Lead pigments can cause anemia, gastrointestinal problems, peripheral nerve damage (and brain damage in children), kidney damage and reproductive system damage. Other inorganic pigments may be hazardous, including pigments based on cobalt, cadmium, and manganese<sup>2</sup>. (See Table 1)
3. Some of the inorganic pigments, in particular cadmium pigments, chrome yellow and zinc yellow may cause lung cancer. In addition lamp black and carbon black may contain impurities that can cause skin cancer.
4. Chromate pigments (chrome yellow and zinc yellow) may cause skin ulceration and allergic skin reactions (such as rashes).
5. The long-term hazards of the modern synthetic organic pigments have not been well studied.

Acrylic paints also contain a small amount of ammonia. Some sensitive people may experience eye, nose and throat irritation from the ammonia. Acrylics and some gouaches contain a very small amount of formaldehyde as a preservative. Only people already sensitized to formaldehyde would experience allergic reactions from the trace amount of formaldehyde found in acrylics. The amounts can vary from manufacturer to manufacturer.

All water-based paints contain a preservative to prevent mold or bacterial growth. Although present in small amounts, certain preservatives may cause allergic reactions in some people. If you experience eye, nose or throat irritation while using acrylics, opening a window is usually sufficient; if not try a window exhaust fan.

## Paint Precautions

Obtain MSDSs on your paints to find out what pigments you are using. This is especially important because the name that appears on the tube of color may or may not truly represent the pigments present. Manufacturers may keep the

1. name of a color while reformulating the ingredients.



<sup>1</sup> "Lead" oil/acrylic paints are no longer available in the state of California, but lead chromate and lead carbonate are found in several pigments that are still available. See Table 1-Toxic pigments.

<sup>2</sup> Cobalt, cadmium, manganese, chromate and zinc are common colors in painting palettes and need to be handled accordingly.

2. Use the least toxic pigments possible. Do not use lead or carcinogenic pigments.
3. Avoid mixing dry pigments whenever possible. If dry pigments are mixed, do it inside a glove box (a box with a glass or plexiglas top and holes in the sides for arms) or inside a laboratory-type fume hood.
4. Wet mop and wipe all surfaces when using dry pigments.
5. Avoid using dishes, containers or utensils from the kitchen to mix and store paints and pigments.

## Solvent Precautions

1. Whenever possible replace turpentine or ordinary mineral spirits with the less toxic <sup>3</sup>odorless mineral spirits. Mineral spirits is also less flammable than turpentine, since its flashpoint is over 100 F (38 C), while turpentine has a flashpoint of 95 F, (35 C).
2. Apply the same health and safety considerations for the use of "citrus" or "pine" solvents. These have been found to be quite irritating to the skin and eyes.
3. If possible, artists should set up their easel in a well ventilated room with a fan moving the solvent vapors away from your face.
4. Techniques such as turpentine washes will require a lot of ventilation because they result in the evaporation of large amounts of solvents in a short period of time. Acrylic paint can be substituted for underpainting.
5. Ventilation only needs to be provided while the solvent is evaporating from the canvas, not during the time while the oil paint film is drying (oxidizing).
6. Wear neoprene gloves while cleaning brushes with mineral spirits or turpentine.
7. Used solvent can be reclaimed by allowing the paint to settle and then pouring off the clear solvent.
8. Paint can be removed from your hands with a rag and/or baby oil, and then soap and water.

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### *Table 1 - Toxic Pigments*

#### Known or Probable Carcinogens/Highly Toxic Pigments

- antimony white (antimony trioxide)
- barium yellow (barium chromate)
- burnt umber or raw umber (iron oxides, manganese silicates or dioxide)
- cadmium red or orange (cadmium sulfide, cadmium selenide)
- cadmium yellow (cadmium sulfide)
- cadmium barium colors (cadmium colors and barium sulfate)
- cadmium barium yellow (cadmium sulfide, cadmium selenide, barium sulfate, zinc sulfide)
- chrome green (prussian blue, lead chromate)
- chrome orange (basic lead carbonate)
- chrome yellow (lead chromate)
- cobalt violet (cobalt arsenate or cobalt phosphate)
- cobalt yellow (potassium cobaltinite)
- lead or flake white (basic lead carbonate)
- lithol red (sodium, barium and calcium salts of soluble azo pigment)
- manganese violet (manganese ammonium pyrophosphate)
- molybdate orange (lead chromate, lead molybdate, lead sulfate)
- naples yellow (lead antimonate)
- strontium yellow (strontium chromate)
- vermilion (mercuric sulfide)
- zinc sulfide
- zinc yellow (zinc chromate)

#### Moderately Toxic Pigments/Slightly Toxic Pigments

- alizarin crimson (lakes of 1,2-dihydroxyanthraquinone or insoluble)
- anthraquinone pigment)
- carbon black (carbon)
- cerulean blue (cobalt stannate)
- cobalt blue (cobalt stannate)
- cobalt green (calcined cobalt, zinc and aluminum oxides)
- chromium oxide green (chromic oxide)
- manganese blue (barium manganate, barium sulfate)
- prussian blue (ferric ferrocyanide)
- toluidine red (insoluble azo pigment)
- toluidine yellow (insoluble azo pigment)
- viridian (hydrated chromic oxide)
- zinc white (zinc oxide)

<sup>3</sup> SCMAC students must use approved odorless mineral spirits or Turpenoid. Absolutely NO turpentine or non-odorless solvents will be allowed in the class.