Preparation of Ink

Abstract

To Study the Preparation of Ink. This project throws a light on types of inks from manufacturing point of view and includes method for preparing them either in chemistry laboratory or at home.

Theory

What is Ink?

Ink is a liquid or paste that contains pigments and / or dyes and is used to color a surface to produce an image, text, or design. Ink is used for drawing and / or writing with a pen, brush, or quill. Thicker inks, in paste form, are used extensively in letterpress and lithographic printing. Ink is an essential item for students, teachers, authors and others. Ink was first, used by the Egyptians around 4000 years ago.

Ink formulas vary, but commonly involve four components:

1. Colorants
2. Vehicles (binders)
3. Additives
4. Carrier substances

Preparation

The history of Chinese inks can be traced back to the 12th century BC, with the utilization of natural plant (plant dyes), animal (squid ink), and mineral offset ink based on such materials as graphite that were ground with water and applied with ink brushes. Evidence for the earliest Chinese inks, similar to modern ink sticks, is around 256 BC in the end of the Warring States Period and produced using manual labour from soot and animal glue. About 1,600 years ago, a popular ink recipe was created. The recipe was used for centuries. Iron salts, such as ferrous sulfate (made by treating iron with sulfuric acid), were mixed with tannin from gallnuts (they grow on trees) and a thickener. When first put to paper, this ink is bluish-black. Over time it fades to a dull brown

Aniline Ink

Following substances are mixed for preparing this type of ink:

1. **Main Materials**

   Blue-black color - Naphtha blue-black
   Blue color - Acid blue, Methylene blue
   Red color - Scarlet red, Eosin
   Black color - Aniline black
   Green color - Malachite green
   Some aniline colors are also used in preparing ink which is dissolved directly in water.

2. Other materials

(i) Glue: Gum Arabic (or gum acacia) is dissolved in hot water and this results in a sticky solution. Mixing of this in an ink solution, helps in many ways :

(a) The ink turns bright.

(b) The color of ink does not fade with time.

(c) The flow of ink is maintained smooth.

(ii) Glycerine: Sometimes, glycerine is also used in preparing ink. The mixing of glycerine checks the early drying of ink. This is mainly used in preparing the stamp pad inks.

(iii) Alcohol : Spirit or alcohol is mixed in ink because it helps in :

(a) Quick drying of ink, and

(b) The ink does not diffuse on papers after writing.

(iv) Boric or carbolic acids: The principal constituents of ink are organic in nature. The breakdown of these materials spoils the ink and this causes deposition of constituents in fountain pen of in the ink pot. Incorporation of boric or carbolic acid to the ink preparation checks this problem.

(v) Scented materials: The organic decay of ink gives it sometimes, foul smell. To avoid this, scented materials are incorporated at the time of ink preparation.

Method of preparing Aniline Ink

For preparing a particular colored ink, first of all a 2.5% solution of that color in distilled water is made.

To this, is added a suitable amount of glue solution.

Now the solution is mixed well and heated for 5 minutes.

During heating, the contents are constantly agitated.

On cooling, the solution is filtered. The process of filtration is a very important step and is carefully repeated several times.

To this is now, mixed a little amount, each of boric acid or carbolic acid, alcohol or spirit and scented material.

This preparation is filtered again and bottled.

If one desires to get a stamp-pad ink then glycerine should be used in place of alcohol during preparation

Gallo-tannic Ink

The following substances are used in its preparations:

1. **Chief constituents :** Following substances are the chief constituents :

(i) Tannic and Gallic acids are used as chief constituents to get blue-black ink.

(ii) Ferrous sulphate and hydrochloric acid also helps in providing blue-black color to the ink and check the growth of fungus.

Other materials: The other materials used are carbolic acid or boric acid, gum Arabic or gum acacia, spirit or alcohol, glycerine and scented material etc. These substances play the same role in

this case as in aniline ink. Basically, it is a mixture of ferrous sulphate, tannic acid and Gallic acid; it is, therefore, also called Iron-gall ink.

Method of preparation of Gallo-tannic ink

Dissolve 250 gm of tannic acid and 80 gm of Gallic acid in about 5 liters of distilled water.

To this solution 250 ml dilute HCl is added.

Dissolve in a separate container 300 gm ferrous sulphate, 20 gm carbolic acid about 4 liters of water.

In a third container, the desired color is dissolved in a little water.

All the three solutions are mixed together.

Also add a little of glue solution, alcohol, scented material, mix well, filter and keep the filtrate for a few days.

Filter once again and store in bottles. The ink is ready for use.

How to prepare ink at home

One drop at a time, add hot distilled water to the bowl of lampblack (you can make your own by completely burning paper or wood) - stop adding water before you think you should and if you, accidentally, get too much water, add more lampblack. Mix until the water is an inky black (lampblack floats and is difficult to dissolve). Once the water is inky black, add a small amount of gum Arabic and mix until the gum has been dissolved in the warm liquid (this homemade ink should be the same consistency as

commercially prepared ink). Store the ink in a small glass bottle for future use. A variant of this recipe is: mix together one egg yolk, one tablespoon gum Arabic and 1/2 cup honey; then stir in 1/2 tablespoon lampblack: this will produce a thick paste which you can store in a sealed container. To use the ink, mix this paste with a small amount of water to achieve the desired consistency

Bibliography

www.chemistryguru.com