

BLACK, *dyers*, is one of the five simple and mother colours used in dyeing: and given differently, according to the different quality and value of the stuffs to be dyed. See DYEING.

Green vitriol strikes a black colour with vegetable astringents, and hence it is the basis of the black dye for cloth, leather, hats, &c. And as solutions of iron with galls, &c. produce the same colour, a method is derived from hence of distinguishing the minutest portions of iron in mineral waters, &c. Neumann.

The substances chiefly employed for producing black colour with vitriol are galls. When a decoction or infusion of the galls is dropped into a solution of the vitriol largely diluted with water, the first drops produce bluish or purplish red clouds, which mingling with the liquor tinge it uniformly of their own bluish or reddish colour. This difference of the colour, says Dr. Lewis (Com. Ph. Tech. p. 346.), seems to depend on the quality of the water. With distilled water, or the common spring waters, the mixture is always blue. A minute quantity of alkaline salt previously dissolved in the water, or a small degree of putridity in it, will render the colour of the mixture purple or reddish. Rain-water received from the clouds, in clean glass vessels, gives a blue, but if it be collected from the tops of houses, gives purple with the vitriol and galls. Both the blue and purple liquors, when more of the astringent infusion is added, deepen to a black, more or less intense, according to the degree of dilution; and if the mixture be a deep opaque black, it again becomes bluish or purplish when further diluted. If it be suffered to stand in this dilute state for two or three days, the colouring matter settles to the bottom in form of a fine black mud, which, by slightly shaking

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Shaking the vessel, is diffused again through the liquor, and tinges it of its former colour. When the mixture is of a full blackness, this separation does not happen, or in a far less degree, for though a part of the black matter precipitates in standing, yet so much remains dissolved, that the liquor continues black. This suspension of the colouring substance in the black liquid may be attributed in part to the gummy matter of the astringent infusion increasing the consistence of the watery fluid, for the separation is retarded in the diluted mixture by a small addition of gum arabic. If the mixture, either in its black or diluted state, be poured into a filter, the liquor passes through coloured, only a part of the black matter remaining on the paper. The filtered liquor, on standing for some time, becomes turbid, and full of fine black flakes; but being freed from these by a second filtration, it again contracts the same appearance, and thus repeatedly, till all the colouring parts are separated, and the liquor has become colourless. The colouring matter, thus separated from the liquor, being drained on a filter and dried, appeared of a deep black, which did not seem to have suffered any change on being exposed to the air for upwards of four months. When it was made red hot, it glowed and burnt, though without flaming, and became a rusty brown powder, which was readily attracted by a magnetic bar; though in its black state, the magnet had no action upon it. The vitriolic acid, diluted with water, and digested on the black powder, dissolved the greatest part of it, leaving only a very little quantity of whitish matter. Solution of pure fixt alkaline salt dissolved very little of it; the liquor received a reddish brown colour, and the powder became blackish brown. This residuum was attracted by the magnet after being made red-hot, though not before; the alkaline tincture, passed through a filter, and mixed with solution of gum vitriol, struck a deep brownish black colour, nearly the same with that which results from mixing with the vitriolic solution an alkaline tincture of galls. For an account of the result of these experiments, see Lewis, *ubi supra*. See also IRON.

For broad-cloths, ne ratines, and druggets, &c. the dyers use woad and indigo; the goodness of the colour consists in there not being above six pounds of indigo to a ball of woad, when the latter begins to cast its blue flower; and, in its not being heated for use above twice. Thus blued, the stuff is boiled with alum, or tartar, then maddered; and lastly, the black given with galls, copperas, and fumac. To bind it, and prevent its smearing in use, the stuffs are to be well scoured in the fulling mill, when white, and well washed afterwards.

For stuffs of less value, it is sufficient they be well blued with woad, and blacked with galls and copperas; but no stuff can be regularly dyed from white into black, without passing through the intermediate blue.

Yet there is a colour called *coal black*, or *Jesuit's black*, prepared of the same ingredients as the former, and sufficient of itself without the blue dye. Here the drugs are dissolved in water that had boiled four hours, and stood to cool till the hand would bear it; then the stuff is dipped in it, and again taken out six or eight times. Some even prefer this black to the other. This method of dyeing black is said to have been invented by the Jesuits, and to have been practised in their houses, where they retained numbers of dyers.

By 23 El. c. 9. nothing of the nature of cloth shall be maddered for a black, except it be first grounded with woad only, or with woad and ancle [blue ind.], unless the madder be put in with fumac or galls; on pain of forfeiting the value of the thing dyed; provided it shall be lawful to dye

any manner of gall-black, and fumac-black [*plain black*], wherein no madder shall be used.

Logwood strikes a black with chalybeate solutions and is employed with those liquors for staining wood black, as picture frames, &c. With the addition of galls, it is used for dyeing cloth and hats black. (Neumann's Works, p. 385.) This black colour is not permanent, though beautiful, any more than the natural violet dye of the *logwood*.

Black may be also obtained by a solution of silver in aqua fortis, when the previous matter stained with this liquor is exposed for some time to the sun and air; and also from solutions of lead in acids, when the subjects to which they are applied are exposed to sulphureous vapours, or washed over with alkaline solutions of sulphur. Calces of lead, melted with sulphur, form a bluish or blackish mass, useful in taking casts from medals. (See CASTS.) Besides, when a solution of silver in aqua fortis is added to a solution of sulphur made in alkaline ley, the silver and sulphur unite and precipitate together in the form of a black powder. See DYEING, and STAINING.

BLACK, *earth*, is a kind of coal found in the ground, which, well pounded, is used by painters in fresco. See *Pit-Coal*, and *Fresco*.

There is also a kind of black made of silver and lead, used to fill up the strokes and cavities of things engraved.

BLACK, *German*, or *Frankfort*, is made of the lees of wine burnt, then washed in water, and ground in mills for that purpose, together with ivory or peach stones burnt. Some suppose, that it is the coal of vine-twigs; but this, says Dr. Lewis (Com. Phil. Techn. p. 377.), does not appear to differ, in any great degree, from that of the small branches of other kinds of trees; but the kernels of fruits yield a coal considerably more soft and mellow, easily crumbling between the fingers into a fine meal. That the Frankfort black is no other than a vegetable coal, appeared, from its burning on a red-hot iron, like charcoal powder, into white ashes, and from the ashes, like common vegetable ashes, being plentifully dissoluble by the vitriolic acid into a bitterish liquor, while the ashes of animal substances are very sparingly affected by that acid, and form with it a compound of a different kind of taste.

This black makes the principal ingredient in the rolling-press printers' ink, which see. It is ordinarily brought from Frankfort, Mentz, or Straßbourg, either in lumps or powder. That made in France is more valued than that of Germany.

BLACK *glass*. See GLASS.

BLACK, *harts*, that which remains in the retort after extracting the spirit, salt, and oil of hartshorn. This residue being ground up with water, makes a black not much inferior to that of ivory.

BLACK, *Indian*. See *Indian Ink*.

BLACK, *ivory*, is made of ivory burnt or charred, ordinarily between two crucibles well luted; which, being thus rendered perfectly black, and in scales, is ground in water, and made into troches, or little cakes, used by the painters; as also by the jewellers to blacken the bottom or ground of the collets, wherein they set diamonds to give them their teint or foil. Some recommend soaking the chips or shavings of ivory in hot linseed oil, before it is charred.

There are particular machines and contrivances for burning the ivory for these purposes, by which the colour is rendered more beautiful than that of the coal which remains in the distillation. Neumann.

The goodness of ivory-black, which is the finest of all the charcoal blacks, may be perceived by its fulness, without a blue cast; and by the fineness of the powder.