

Carbon Inks - Information and Recipes

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A carbon ink is prepared by mixing powdered soot or charcoal in a solution of water and binding media (such as gum arabic).

Carbon inks:

1. Soots - “Black particles, of submicron-size, composed primarily of carbon produced by [incomplete combustion](#) or pyrolysis of coal, oil, wood, and other hydrocarbon-containing materials. Diesel engines produce a major fraction of air pollution due to soot.”¹
 - a. Usually collected as residue produced by a flame
 - b. Examples:
 - i. [Kremer Furnace Black](#) (also called Lamp Black)
 1. [Details](#): The preparation for Lamp black has been known since classical times. Lamp black is nearly pure amorphous carbon which is collected in brick chambers from the condensed smoke of a luminous flame from burning mineral oil, tar, pitch or resin.
2. Chars - “Solid carbonaceous residue of high calorific value, derived from incomplete burning of organic material. It may be formed into briquettes and burned for fuel; if pure it can be used as a filter medium. Charcoal is made from wood or bone; coke, another char, is derived from [coal](#).”²
 - a. The charred remains of wood
 - b. Examples:
 - i. [Kremer Charcoal](#)
 1. Made from burning of beech. [MSDS](#)

¹ Atkins, Tony, and Marcel Escudier. "soot." [A Dictionary of Mechanical Engineering](#). : Oxford University Press, 2013. [Oxford Reference](#). 2013. Date Accessed 21 Apr. 2016
<<http://www.oxfordreference.com/view/10.1093/acref/9780199587438.001.0001/acref-9780199587438-e-5880>>;

² "char." [A Dictionary of Geology and Earth Sciences](#). Ed. Allaby, Michael. : Oxford University Press, 2013. [Oxford Reference](#). 2013. Date Accessed 21 Apr. 2016
<<http://www.oxfordreference.com/view/10.1093/acref/9780199653065.001.0001/acref-9780199653065-e-1404>>;

Standard recipe of the Ancient Ink Lab:

- Gum arabic/water solution:
 - 10:1 water:gum arabic by weight
 - Dissolved powdered gum in water solution so there are no lumps - stir, leave for a few minutes, stir again, push lumps of gum arabic against side of container to disperse. Repeat until there are no lumps
 - E.g. 1g of powdered gum arabic dissolved in 10ml water
- Ink:
 - 9:1 gum arabic/water solution:carbon by weight
 - Measure out 1 part carbon powder. Add 9 parts of the gum/water solution by weight and mix.
 - E.g. Measure 1g soot, then, without zeroing the scale, add the gum arabic solution until the total weight of your materials reaches 10g. This will give you a 9:1 ratio.

To make a small batch:

Ingredients:

- 30 ml water
- 3g gum arabic (<http://shop.kremerpigments.com/en/> Item #63330)
- 3.67g lampblack (furnace black, soot) (<http://shop.kremerpigments.com/en/> Item #47250)

Instructions:

1. Create a 10:1 water to gum arabic solution: Dissolve gum in water so there are no lumps - stir, leave for a few minutes, stir again, push lumps of gum arabic against side of container to disperse. Repeat until there are no lumps. This may take some time as the gum “swells” in the water, but eventually it will become lump-free.
2. Incorporate the lampblack into the gum arabic solution until homogeneous. Use the ink!