

What's Inside Blue Ballpoint Ink? Fatty Acids and Alcohol

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THE VOORHES

SYNTHETIC DYES

Patents for ballpoint pens go back to the late 1800s, but it took half a century to develop good, fast-drying inks. Bic, Pilot, and other makers jealously guard their formulas, but to get that classic ballpoint blue, these companies mix up a cocktail of colorants. A few likely suspects are phthalocyanine blue, the awesomely named crystal violet, and Prussian blue, a longtime favorite of painters that's made from iron and cyanide. That last one was used as invisible ink in World War I: Spies wrote in iron chloride, which could then be treated with potassium ferrocyanide to make the words appear. Crystal violet was another wartime staple: It has antibacterial properties that made it a cure-all for infections during the Great War and a weapon against thrush in babies. Unfortunately, it perhaps

might be a wee bit carcinogenic.

Phenoxyethanol/Benzyl Alcohol

On their own, the solid or powdered colorants are the wrong texture for scribbling across the page. Rollerball pens use a thinner, water-based ink to get that runny feel, but ballpoint inks rely on organic compounds as the carrier—often one of these two. Benzyl alcohol is the sweet perfume produced by ripe fruit, while phenoxyethanol is the ultimate multipurpose ingredient in everything from bug repellent to antiseptics to fish sedatives (true!). The colorants mix with these compounds, creating a dye that flows smoothly over the rotating ball and onto your paper.

Alkyl Alkanolamide

For a basic dye to permeate paper, it needs to have the right surface tension. Pen makers use surfactants like alkyl alkanolamide to lower the surface tension of the solution so it can absorb into that Post-it before the ink dries.

Oleic Acid

Ink can gunk up a pen's brass point. A fatty acid like this one lubricates the ball so it's always ready to roll, no matter how long the pen's been sitting in your bag, waiting for you to stop texting.