

Chemical Calligraphy

Using the Dscript BioChem Notation it is easy to turn organic chemicals into attractive calligraphy works. Dscript BioChem Notation is a component of Dscript Notation (<http://dscript.org/note.pdf>), which is built upon the Dscript Alphabetical 2D writing system (<http://dscript.org/dscript.pdf>).

Dscript BioChem attempts to simplify the memorization of the large complex molecules and structures in organic chemistry.

This method is **NOT** meant to replace standard notation.

This is primarily meant as a **mnemonic device** and **art form**.

NEW : Now with bonds and hydrogen : Chemical Calligraphy v1.1 : <http://dscript.ca/chem2.pdf>

To fully grasp the molecules and their properties you will still need to understand bond strength, and visualize the 3D molecule. Visualization is best done with computers and 3D rendering. Here we focus on the elements and their arrangement/connections.

Hydrogen is dropped entirely. In a biochemical environment hydrogens are bounced around, traded and swapped so much that we will consider them “like electrons”.

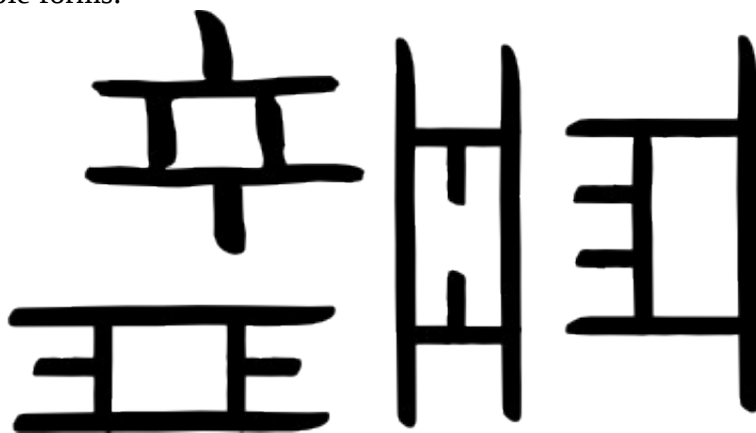
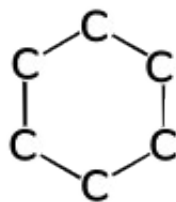
This is not a replacement to standard studies, but a supplement. With a proper understanding of chemistry you should easily be able to use this to memorize the overall structure and then fill in the other details on top.

Element #1 Carbon

+ or †

Carbon can be drawn in 2 possible forms.

Benzene



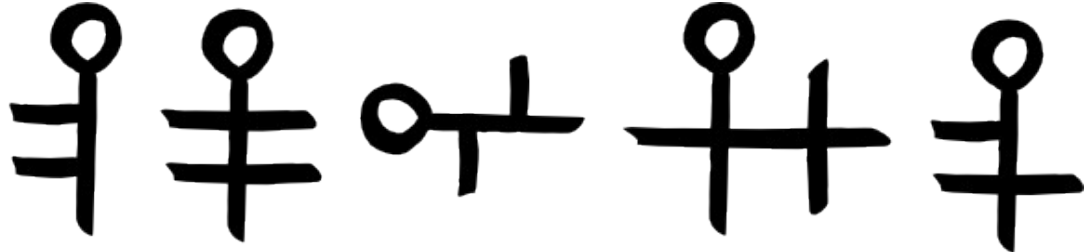
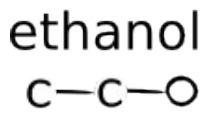
Above you see a Benzene ring. There are actually many ways to draw this, here are just a few. All of these read as “6 carbons in a ring”.

In all of these examples you will notice the intersection only has 3 lines, not 4 (which is also valid). I find using only 3 lines makes it easier to process and memorize. The primary goal is to simplify.

Element #2 Oxygen



Oxygen is drawn as a circle



Above you see 5 possible forms of ethanol. All read exactly the same as “C – C - O” or “O – C - C”

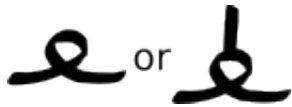
Below we have an example that uses a benzene ring and some oxygen, as well as some more carbons.



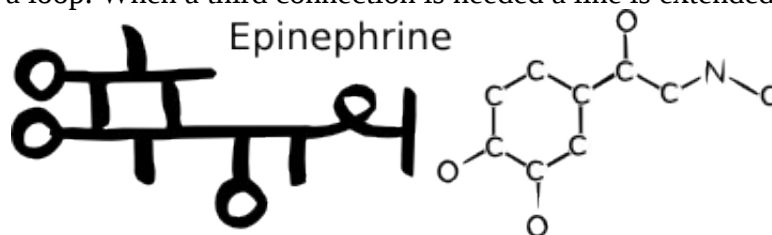
These are just 2 possible forms of acetylsalicylic acid, there are plenty more ways it could be drawn.

Determining which is the best mnemonic device is a personal issue, whatever works best for you!

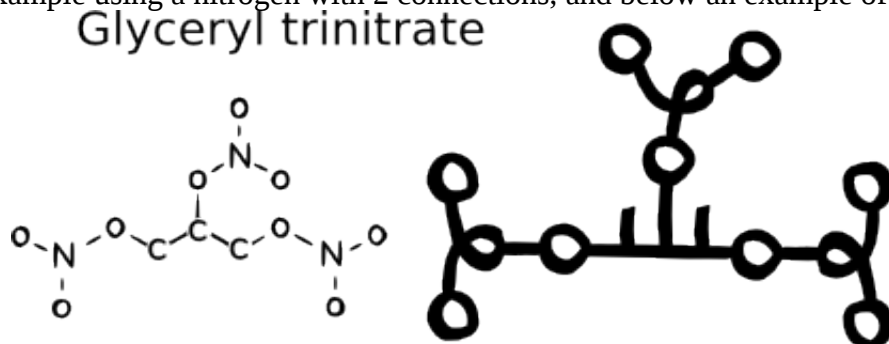
Element #3 Nitrogen



Nitrogen is drawn as a loop. When a third connection is needed a line is extended out of the loop,



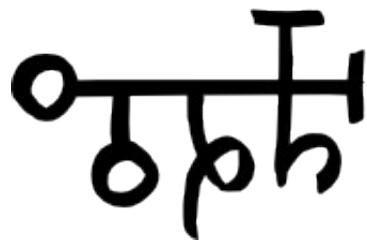
Above is a an example using that a nitrogen with 2 connections, and below an example of 3 connections.



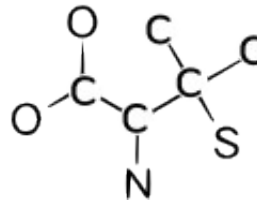
Element #4 Sulfur



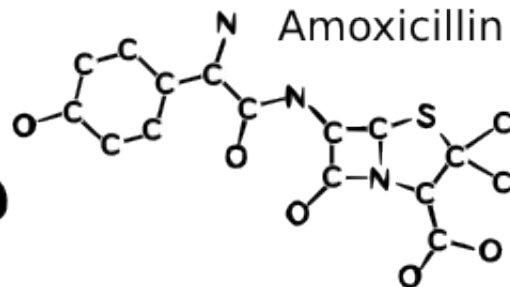
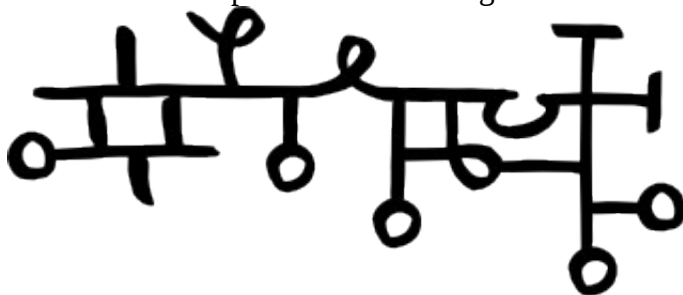
sulfur is drawn a curve, connected on either side with sharp angles.



Penicillamine



Above we see an example with sulfur using one connection, and below using 2 connections.



Amoxicillin

Element #5 Phosphorus



Phosphorus is an intersection of 2 lines with a third line making a triangle in one of the 4 quadrants.

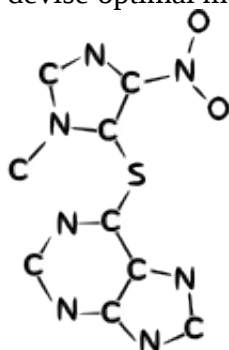


phosphate

Here is a simple example using all 4 connections.

Complex Rings

Complex ring structures yield many possible ways of drawing them, and it can take some time to devise optimal methods of drawing them but there are elegant ways of drawing almost any structure.



Azathioprine

Here are some examples of the encapsulation method

The symbol for Mg(magnesium) can be simply encapsulated with a circle



Or you can try to conserve pen strokes by first drawing the circle then continue inwards with the Mg



Or you can be creative and first draw the M then continue into the circle and add the G curl after coming all the way around. (It looks correct even though the stroke order was changed)



Or you can be creative with the symbol itself, in this example we reverse the “G curl” to the left side. You must be very careful when altering the symbols to ensure it does not become ambiguous with other elements.



Here is Fe with the circle drawn fluidly after the element symbol



This is how the circle is added fluidly



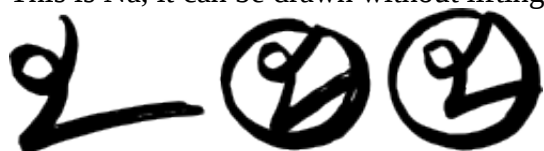
Here is yet another way of drawing Fe, but this time drawing the circle out of the “F”



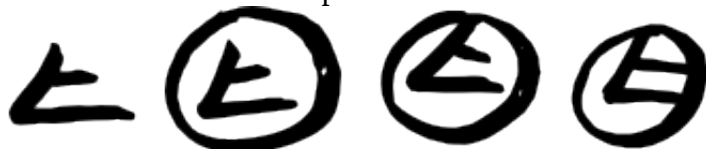
Here is K in 2 basic forms



This is Na, it can be drawn without lifting the pen at all



This is Ca in a few of its possible forms



The system is designed for flexibility and creativity. But ambiguity is not acceptable, so be careful ;)

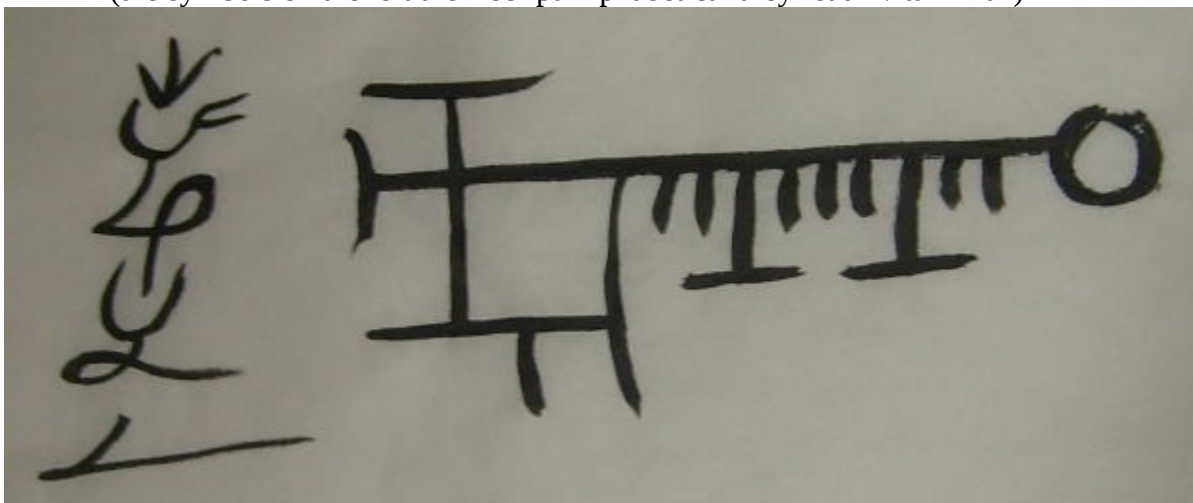
Calligraphy Examples

Here are a few examples of what the calligraphy can look like.

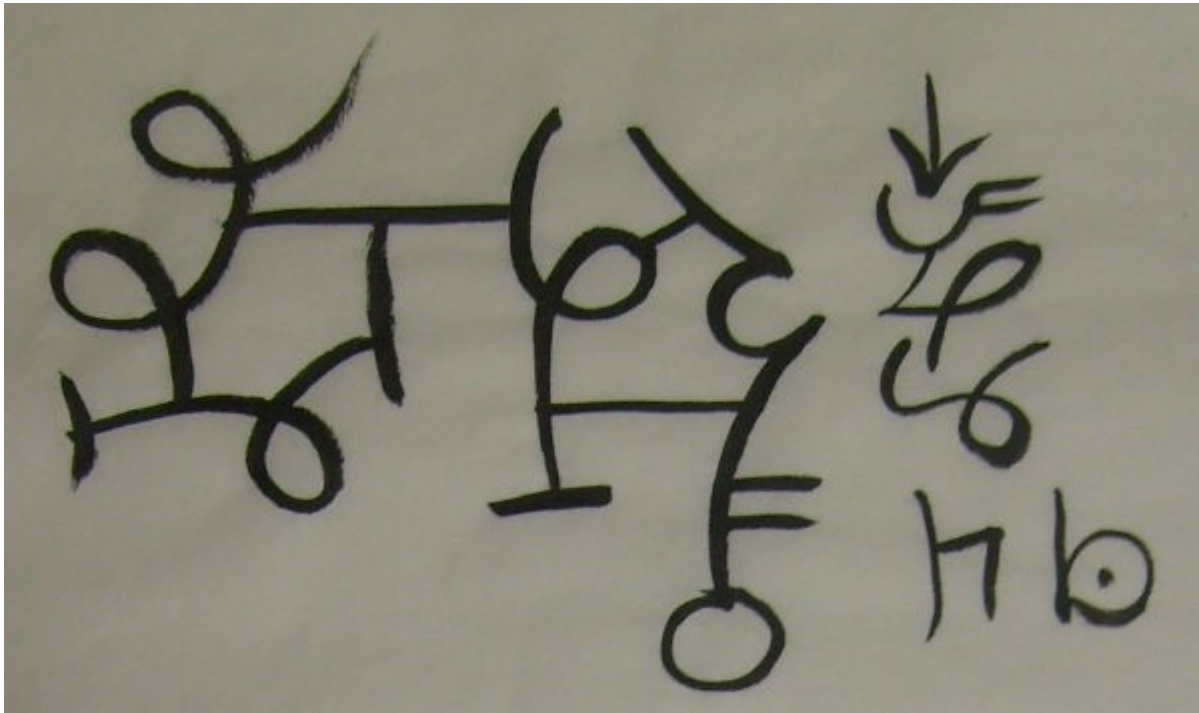
Remember, each is just an example of 1 of the many possible ways a molecule could be represented with this system.

For the vitamins one form of each was chosen (many vitamins are actually groupings of many different molecules that all share a single function or purpose)

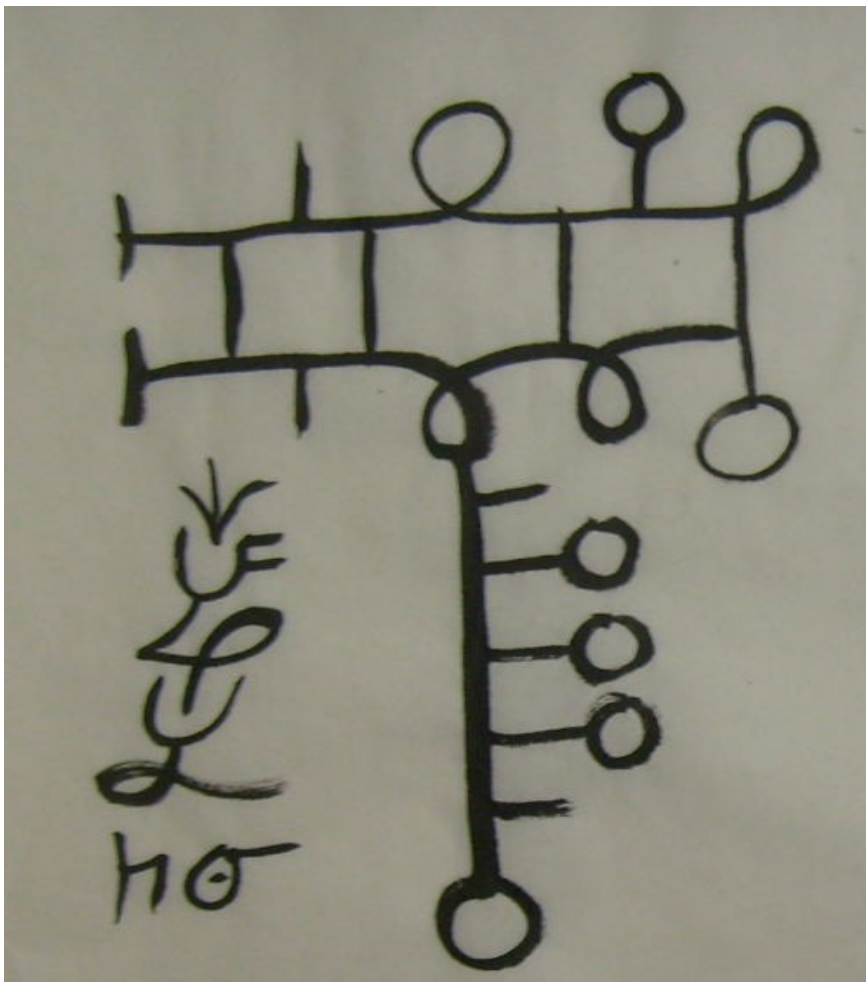
Vitamin A (the symbols on the left are Dscript Alphabetical they read "vitamin a")



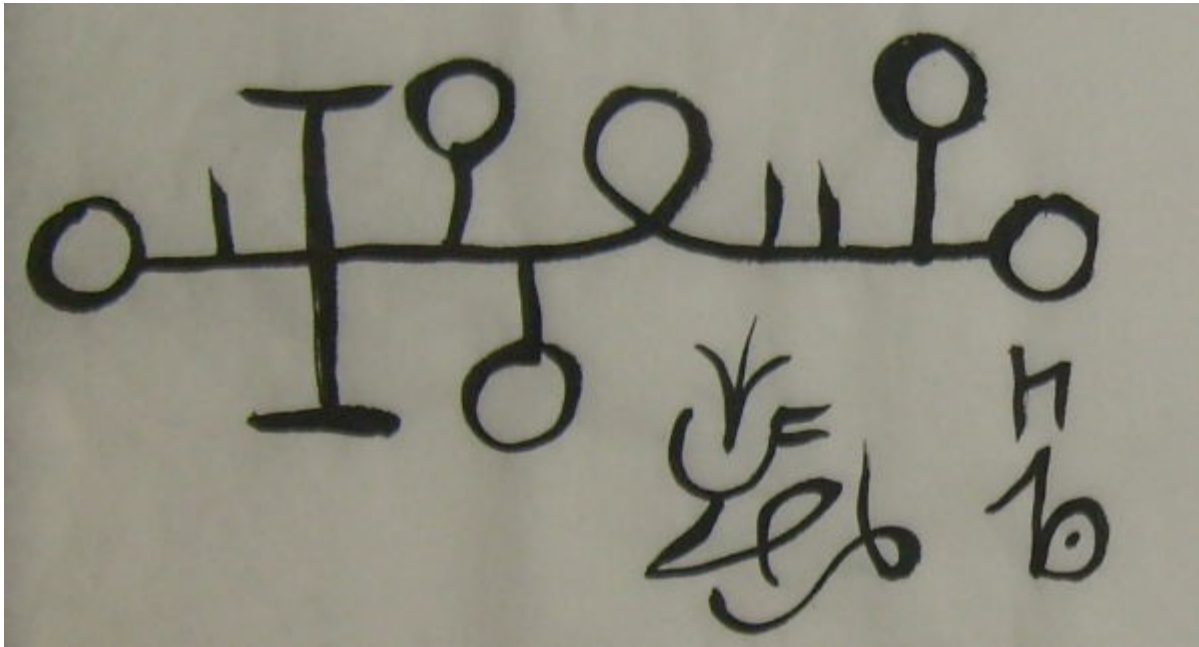
Vitamin B1



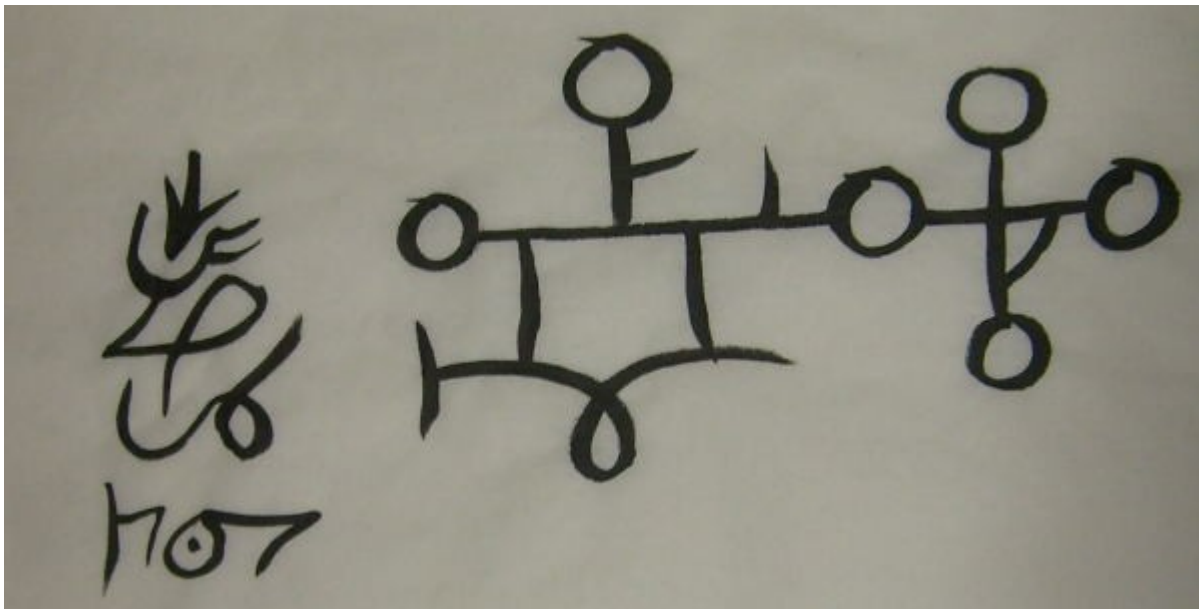
Vitamin B2



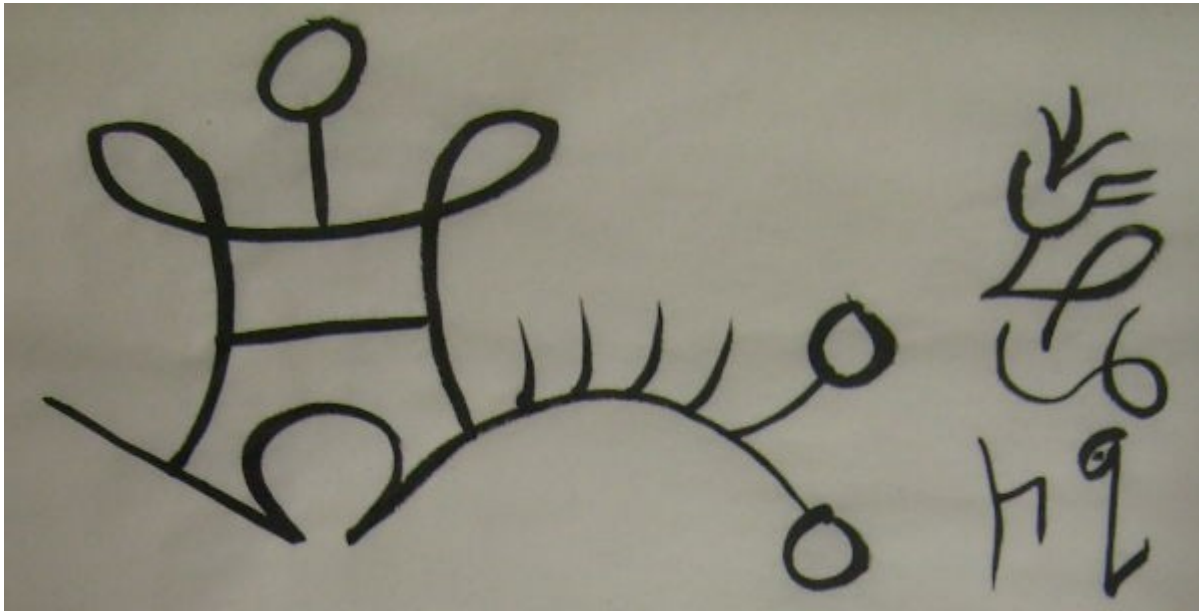
Vitamin B5



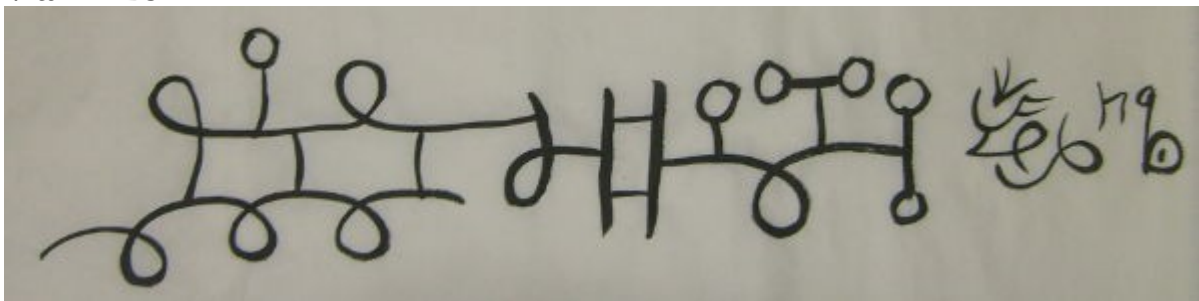
Vitamin B6



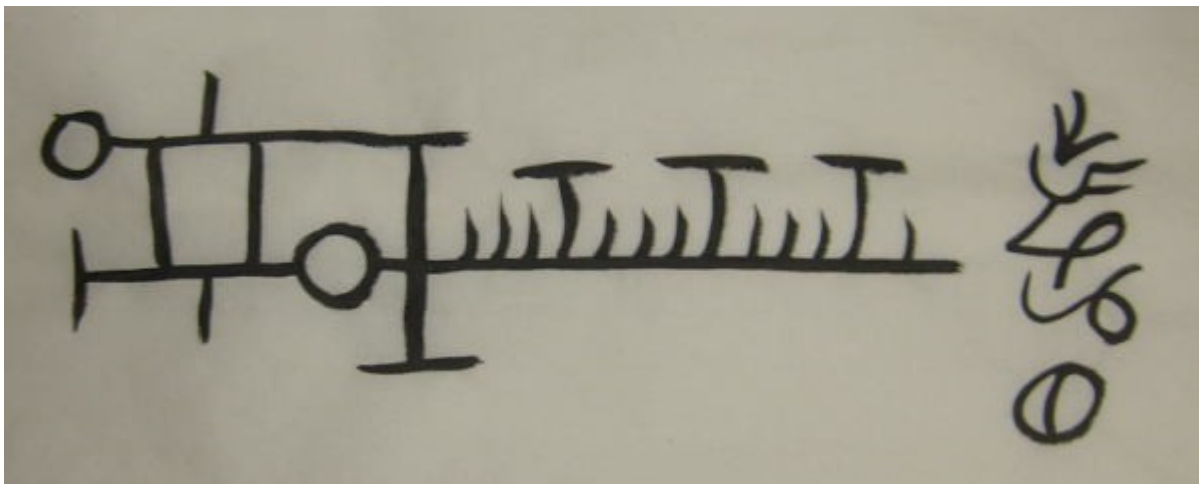
Vitamin B7



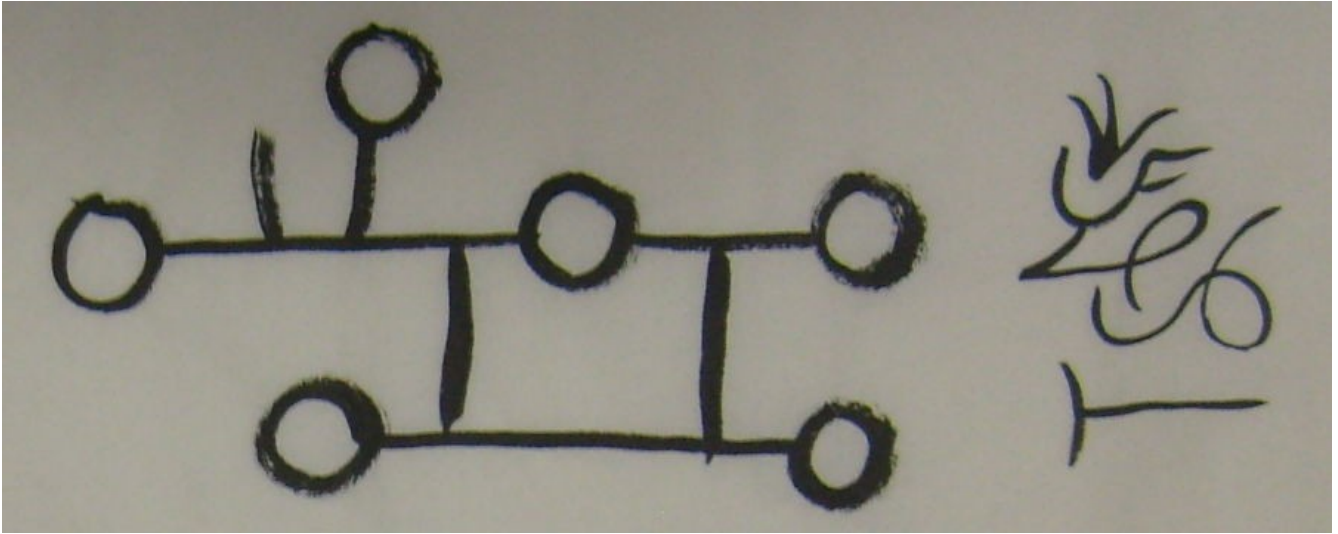
Vitamin B9



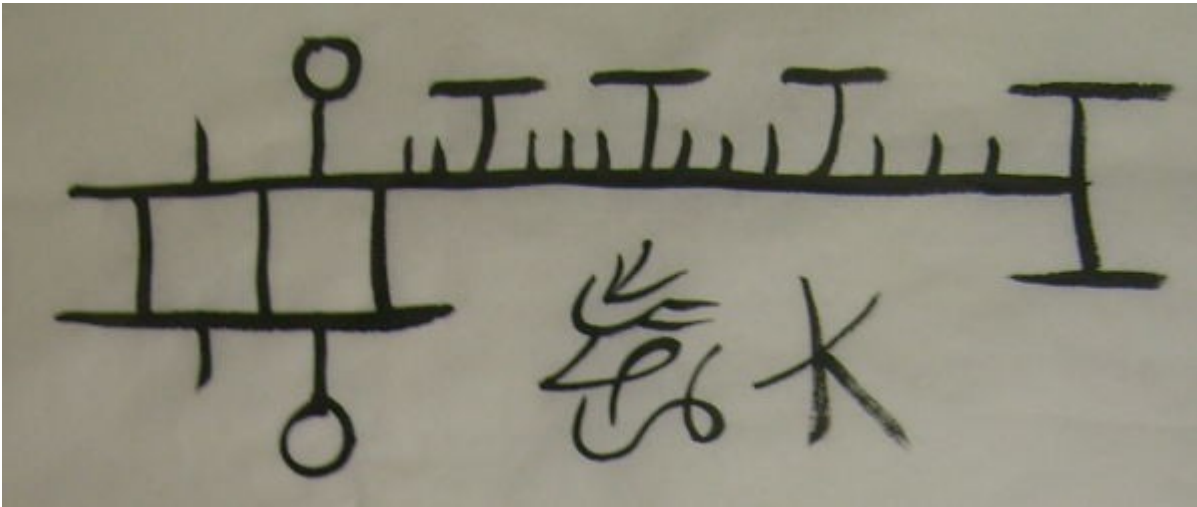
Vitamin E



Vitamin C



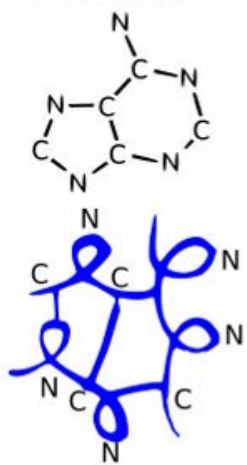
Vitamin K



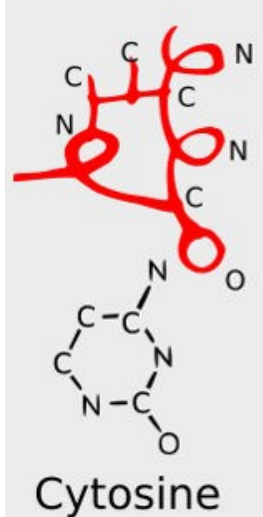
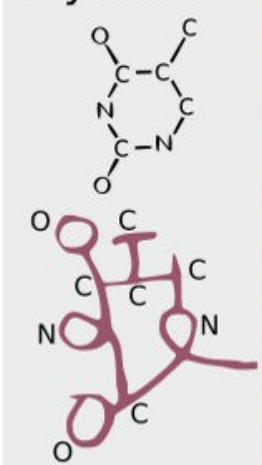


Dscript - 2D writing system

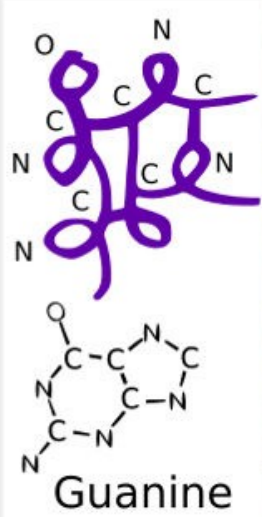
Adenine



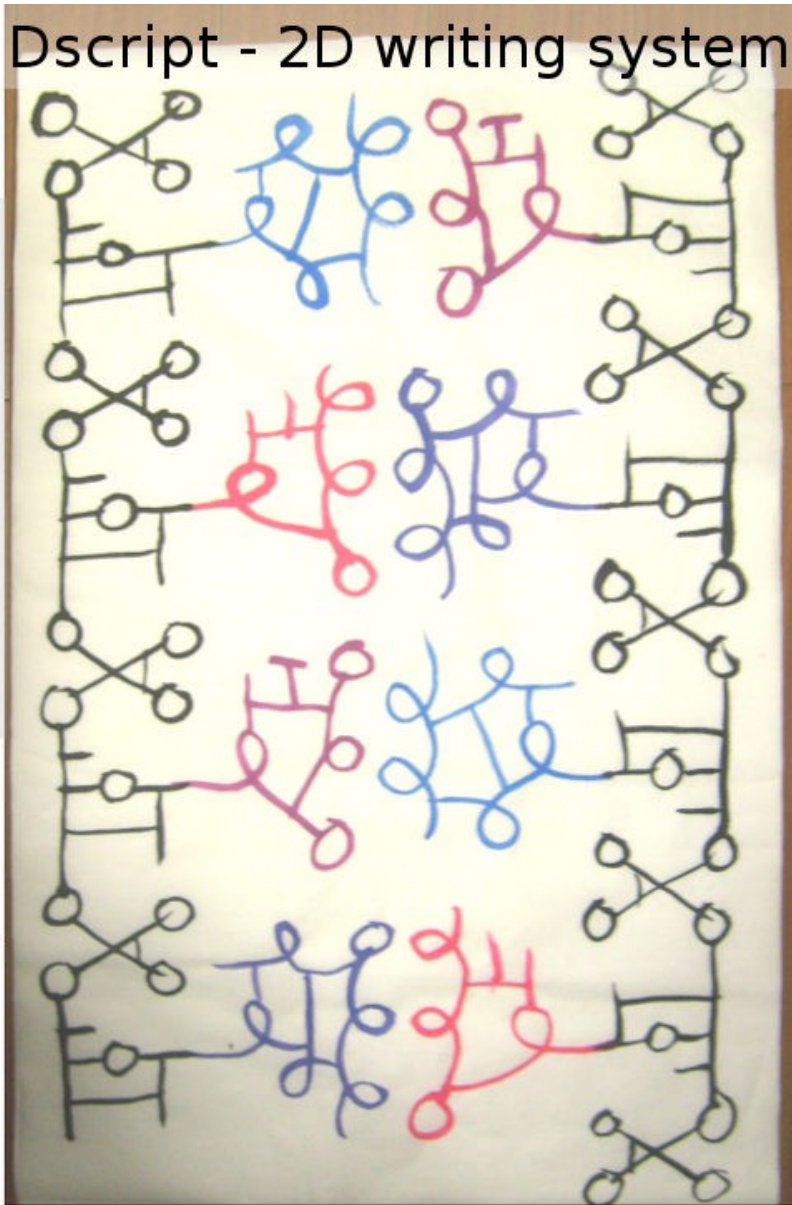
Thymine



Cytosine



Guanine



Chemical Calligraphy - DNA

****If you like Dscript, you may also like WireScript, a 2D/3D writing system that can be written by bending wires. Works great for art, sculptures and jewelry.**

<http://dscript.org/wirescript.pdf>

NailScript, A layered writing system for writing with hammer and nails.

<http://dscript.org/nailscrip.pdf>

“Mad Science”/“Technology Art” inventions and experiments. Great DIY fun.

<http://dscript.org/inventions.pdf>



Dscript by Matthew DeBlock is licensed under a Creative Commons Attribution 3.0 Unported License. Based on a work at www.dscript.ca and www.dscript.org