FEATURE

Schiff Base Shuffling: Paul Kiler's New Work with Old Chemistry

The California-based perfumer's experiments allow him to play with scent structures—and expectations.

BY EDDIE BULLIQI, independent journalist

New perfumery molecules are being put under greater scrutiny by the F&F industry than ever before, not only on the regulatory side, but also by today's consumer, whose cultural codes are dictated to a greater and greater degree by naturals and naturality. Combine that with a mythologized distrust for synthetics and stunted space for the discovery of new synthetics (versus the 1970s, when the novelty of aroma chemicals was virgin territory), and you have a significantly discouraging drag wind for scent chemists.

Self-taught independent perfumer Paul Kiler, winner of the Aftel Award for Handmade Perfume at the 2019 Art and Olfaction Awards, is taking an alternative path with both his perfumery and chemistry. The California-based Kiler’s experiments with Schiff bases are allowing him to play with scent structures and expectations in innovative ways using these super-heavy, high-performing molecules.

This interview reviews how Kiler is using Schiff bases in his perfumes and what he hopes to discover with further experiments.

Eddie Bulliqi [EB]: How did you first come to perfumery and what did you set out to achieve?

Paul Kiler [PK]: In rebellion to the 1990s men’s "sports" fragrances that all gave me a headache, I just wanted to make a scent that I could wear and not have an adverse reaction to. The one fragrance at the time touted as great was Joop Homme, which was also awful to me. Basically, I hated all the popular men’s scents from the 1990s and was looking for something for myself that was a full and orchestral composition with ingredients that I liked. I wanted to try to do something myself that was better than what I found on the market.

EB: What assets do you think the self-taught perfumer brings to composing versus those of the house-taught tradition?

PK: I've never apprenticed nor worked in a fragrance house outside of my own, and I've hardly ever taken any perfumery classes—just nine hours in Los Angeles. So, I really can't exactly say what I would possess now had I been through the traditional format of the profession. But I will say that I think that what my self-taught education has placed in me is a freedom to follow my own heart, with both successes and failures. My suspicion is that house taught perfumers will follow a path that relies more on past successes and copies/variations of current scents, likely a more formulaic style of perfumery than what I find myself doing. I really hate clones; I'd much rather do something of a flanker style but still prefer to make a client an original scent.

Another big difference is that I am just a one-man band here, which has its own strengths and a whole lot of weaknesses. As an artist, coming from many mediums before perfumery, I can adopt a working style that I know works really well for me, instead of being molded into the image of someone/something else.

EB: You are becoming increasingly known for working with your unique self-made Schiff bases. Could you start by explaining what they are and why they interest you?

PK: Schiff bases have very technical definitions, but, in this case, I'll make it pretty simple: a Schiff base is a new molecule made when two molecules combine and then kick out a water molecule. Most commonly, a Schiff base starts with an anthranilate and an aldehyde, but other combinations are possible with other molecule types. The most oft-used Schiff base is aurantiol, made with methyl anthranilate and hydroxycitronellal. A lot of times, the new molecule is strongly colored, which is likely why Philip Kraft tells me that they have fallen out of favor in perfumery.

Schiff bases interest me because they can be very strongly odored molecules — you may only need to use a small amount of one to get great effects and they're usually quite large and long-living molecules.

EB: When and why did you start experimenting with your own Schiff bases? Were you initially approaching it more from a technical performance or olfactory hedonic standpoint?

PK: I must have started learning about Schiff bases about 2009. I was fascinated that I could make new molecules from these two disparate starting molecules, and that the new combination was different while still retaining aspects of both original molecules. I had found an absolute dearth of pertinent context; I think that in all of my perfumery chemistry resources I only came up with maybe 10 pages of information. So, I embarked upon my own path of education and experimentation to broaden the number of materials available to me in my works and, essentially, to make my own captives.

EB: Schiff bases have been long-present in commercial composition. How are your experiments different from what came before and how do they represent innovation?

PK: In many aspects, they are not different, but, today, Schiff bases are not as prevalent as they used to be. Obviously, I am not aware of big companies' experiments to state definitively here about their development. I think the difference is that I am not really constrained by a raw materials budget and can possibly experiment with more expensive materials than large houses would want to due to time-consuming small yields.

EB: Can you produce entirely new smells with your method, or you focus mainly on extending the life of volatile notes? Any examples?

PK: I am both able to produce entirely new smells and extend the life of more volatile notes. So many people have lamented that a lemon note can only last for a very short time. Through my experiments, I've made a lemony type molecule that lasts five weeks on a strip, and I use that in my 'Long-Lasting Lemon' base, that lasts three weeks on a strip. I'm also looking for new options for green in the base notes instead of using lilial and lyral types.

EB: How many of your experiments have resulted in something you deemed usable and great and how many have you had to abandon?

PK: So far, after more than 150 bases, there are a lot of interesting discoveries. Maybe about 35 are really great/interesting, and 50 more are fairly useful. I still have a lot more to try out! Combinations of several materials in a reaction are interesting, and Schiff bases made with essential oils also have some utility to explore.

EB: Which of your scents have you used Schiff bases in and why did you use them?

PK: So far, I have kept the number of my bases in perfumes for clients down to a few, but I use them more freely in my own PK Perfumes line. Now that I have started to understand these new materials, I'm using them more and more in my new scents. Some of my perfumes use up to 12 bases, all in small amounts, to shape the perfume in the direction I wish or need it to go. These molecules can be very large; some are over 460 MW and still fairly volatile. I had to come up with a new timeline stratum in the evaporation curve because these last so much longer than traditional base notes. I mark them as the "last notes."

EB: What areas are you targeting in your future chemistry work and what excites you the most about its potential application?

PK: I think that a lot of the attention of Schiff bases centers around what ends up being more in the orange blossom end of Schiff base possibilities. I'm really interested in what I can discover that no one else has made before.

I'll make one last comment to perfumers out there that are less familiar, or unfamiliar, with how Schiff bases form and work, because I've seen some amazing failures when Schiff base formation after bottling was not accounted for. I use Roja Dove's fragrance Creation E/Enigma as a lesson in my Schiff base class that I teach. The perfumer who formulated this fragrance did not account for the Schiff base formation between the methyl anthranilate and the vanillin and/or ethyl vanillin. The result is that the scent gets rather dark brown in color and acquires a root beer note over time; none of which, I'm sure, was intentional. They inadvertently created a Schiff base in the scent that takes place a year or so after bottling. Even though Schiff bases may have fallen out of favor, and not much is taught about them, knowing how to use them, how they form and how to avoid them getting made after bottling are very important for all perfumers to know, understand and utilize.