

## NEW FLAVORS AND FRAGRANCES

SUPPLEMENT

The exhibition embodies multiple threads of abstraction, from the systematization of artificial flavors within the pre-existing paradigm of industrial production to a non-mimetic idea of scent perception and molecular structure rooted in the material specificity of substances. Olfactory perception (which along with taste are considered “the chemical senses”) is the proper domain for the perception of material specificity as it is based in the molecular structure or the primary “chemical signature” of a material.

Central to Raspet’s practice is a notion of the “formulation”—an alignment between a substance and a set of logical-linguistic processes and procedures: an exchangeability or correspondence between materiality and its systematic representation (as in for, example the correspondence between Coca-Cola’s chemical formulation and the parameters of its systematic representation within advertising).

As a working procedure for Raspet, this concept entails an extreme material reduction, and a paradigm of working with materials in which arbitrary, spatial considerations such as form and compositional arrangement are screened out in favor of underlying structural relationships. The space for decision making within this paradigm occurs in the exchangeability and rearrangement of the ratios of the components of a formulation—which is simultaneously a substance and an algorithm; text and material.

All artworks in the exhibition are colorless or nearly-colorless liquids composed from the common chemical compounds of the flavor and fragrance industry. In the accompanying documentation, compounds are denoted through a compressed text-string entry system. As in language, minor differences in the compositional structure have considerable consequences. Like many commercial materials, the formulations are sold on a volumetric (per litre) basis. However, the respective intangible rights to the formulations—the legal capacity to combine the specified chemical materials together into a single mixture—are sold separately, in which case the artist will relinquish his future ability to combine the components of a formulation and will transfer this exclusive right to the buyer.

Raspet’s research into functional perfumery and the flavor and fragrance industry—is an ongoing aspect of his focus on the underlying materiality of abstract systems, which have included financialization, legal administration, and data processing.

1. A 4 x 4 grid of sixteen related artificial flavor compounds, as detailed in Figure 1 and Figure 2.

METHYL METHANOATE	METHYL ETHANOATE	METHYL PROPANOATE	METHYL BUTANOATE
ETHYL METHANOATE	ETHYL ETHANOATE	ETHYL PROPANOATE	ETHYL BUTANOATE
PROPYL METHANOATE	PROPYL ETHANOATE	PROPYL PROPANOATE	PROPYL BUTANOATE
BUTYL METHANOATE	BUTYL ETHANOATE	BUTYL PROPANOATE	BUTYL BUTANOATE

Figure 1. IUPAC Nomenclature

<chem>COC(=O)</chem>	<chem>COC(=O)C</chem>	<chem>COC(=O)CC</chem>	<chem>COC(=O)CCC</chem>
<chem>CCOC(=O)</chem>	<chem>CCOC(=O)C</chem>	<chem>CCOC(=O)CC</chem>	<chem>CCOC(=O)CCC</chem>
<chem>CCCOC(=O)</chem>	<chem>CCCOC(=O)C</chem>	<chem>CCCOC(=O)CC</chem>	<chem>CCCOC(=O)CCC</chem>
<chem>CCCCOC(=O)</chem>	<chem>CCCCOC(=O)C</chem>	<chem>CCCCOC(=O)CC</chem>	<chem>CCCCOC(=O)CCC</chem>

Figure 2. SMILES Nomenclature (“C”=carbon, “O”=oxygen, hydrogen is implied)

The grid embodies a rudimentary codex of the flavor and fragrance industry. It is composed of 16 basic molecules of the ester class. Esters are commonly used as artificial flavor building-blocks (especially for fruit-based flavors) in the flavor industry. They are also used in industrial chemistry as precursors and solvents, including chromatographic solvents for performing chemical analyses on foods and beverages.

The compounds are arranged by their structural correspondences and IUPAC standard grammatical nomenclature, with the lightest molecule (Methyl Methanoate) at the top left and the heaviest (Butyl Butanoate) at the bottom right. As the grid progresses from top to bottom and from left to right an additional carbon atom is added to the linear structure of each molecule at each stage—either on its left or right side.

As evidenced in their nomenclature, esters are composed through recombination (a compound with an OH group reacts with an acid in the presence of a catalyst, causing both compounds to join together into a single molecule through a reversible reaction). They thus exhibit synthetic, recombinant—even “playful”—material properties in their very chemical operation: a quality that is echoed in their commercial synthetic function in the flavor industry.

The grid arrangement evidences the system by which phenomenological perceptions, and common concepts/objects—such as “apple, or “orange” can be exchanged for one another through the redistribution of their component ingredients. It is the system for codifying these phenomena into the pre-existing template of industrial production through economically available materials.

2. Available in the office, Raspet has produced a system of documentation that cross references the organoleptic (olfactory and taste) properties of each of the 16 compounds to the compounds’ measured presence in various fruits through chromatographic analyses. The keyword descriptions of the compounds were compiled from 7 comprehensive literature sources. These keywords were then cross-referenced to related to chemical analyses of the objects they refer to (for example, gas chromatographic-mass spectrometry analysis of air samples taken above the respective fruits).

3. From this document, 4 keyword formulations have been produced for the terms “FRUITY”, “ETHEREAL”, “PEAR” and “APPLE” based on a statistical cross-referencing of the above 16 compounds as they are described in the 7 comprehensive literature sources. Compounds are included in the resulting mixtures in proportion to the frequency of their citation in relation to a given term across the literature.

4. Moving away from the nominally mimetic (though heavily abstracted) paradigm of artificial flavors, the remaining formulations of the exhibition highlight Raspet's interest in a non-mimetic understanding of scent and material specificity.

Utilizing esters and other chemical compounds, such as aldehydes and ketones, Raspet has created mixtures based on structural-formal correspondences of their molecular components. The mixtures are conceived of as simultaneously textual and material operations. They can be visualized as text strings in the SMILES (Simplified Molecular Input Line Entry System) format (Figures 3. - 6.). Echoing the format of this representational system, all of the molecular compounds utilized in the exhibition have a linear, string-like physical structure.

For Raspet the formulations point to the most basic level of abstraction that can be perceived phenomenologically and materially. The sense of smell allows for the distinguishing between minute differences in material structure that cannot be perceived visually. The resulting scent perception is an abstraction or averaging of the quality common to all of the closely related chemical ingredients present in the mixture. The recipient of the odor is smelling simultaneously the individual chemical components and their programmatic interrelationships or the textual operations upon the materials: the general quality or movement as it arises from the specific.

The basis for these operations is similar to a recursive text operation, in many cases. For example, the formulation with the informal title "Aldehyde Gradient" (Figure 4.) consists of 5 related molecular structures: aldehydes C8 through C12. Each of the included molecules differs from the previous molecule only by the addition of a carbon atom in the linear structure of the compound. Likewise, the formulation with the informal title "Phantom Ringtone" (Figure 3.) consists only of two closely related molecules in which an oxygen atom that shares a double bond with one of the carbon atoms is repositioned one carbon further down the linear structure of the molecule.

Though composed from an abstract textual operation, Phantom Ringtone also embodies the another layer of abstraction common to the fragrance industry: that of narrative. The formulation is Raspet's attempt to embody the common, contemporary phenomenon of "phantom ringing"—the experience of mistakenly feeling that one's cell phone is ringing or vibrating in the absence of an incoming call or text. The abstract capacity of the cell phone as a communicative medium is distilled into a hallucinatory anticipation that then becomes the basis for a further abstraction into a fragrance formulation that "captures" the essence of this experience. Raspet's design for the fragrance attempted to produce an experience of confusion that alternates between familiarity and non-specificity—a smell without a reference point.

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CCCCCCC=O
CCCCCCC(=O)C
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Figure 3. (Phantom Ringtone), SMILES format

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CCCCCCC=O
CCCCCCCC=O
CCCCCCCCC=O
CCCCCCCCC=O
CCCCCCCCC=O
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Figure 4. (Aldehyde Gradient), SMILES format

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CCCCOC(=O)
CCCOC(=O)C
CCOC(=O)CC
COC(=O)CCC
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Figure 5. (Ester Vector), SMILES format

CCCCCCCC=O  
 CCCCCC(=O)C=C  
 CCCCCCCC=O  
 CCCCCCCCC=O

Figure 6. (key/coin), SMILES format

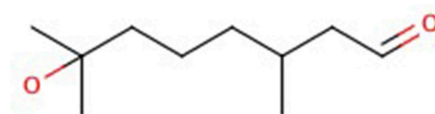
5. The formulation key/coin has been composed based on an airspace analysis (gas chromatography-mass spectrometry) of the chemical compounds present above keys and coins that have been handled by human hands. Keys and coins are both paradigmatic of an abstract capacity (i.e. exchange, or access) embodied in a resolutely physical entity.

Here the exhibition returns briefly to a referential paradigm in order to embody this abstraction as a physical, olfactory material. The characteristic smell of coins and keys are the byproducts of metal ions' reaction with the human body as they are touched. The formulation distills this chemical trace of the body into a synthetic fragrance—an abstraction or codification of the physical residue of the immaterial entity of value.

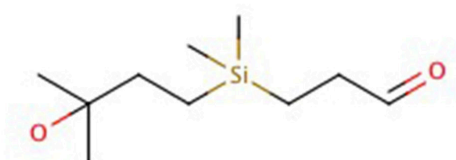
6. In conjunction with the exhibition, Raspet has designed a new fragrance molecule based on the structure of 7-hydroxycitronellal—an industrially produced synthetic floral odorant. Raspet has altered the original structure of 7-hydroxycitronellal by substituting a sila-dimethyl group at the position of the 4th carbon of the original molecule (Figure 3).

This shifts the 3-methyl group one position further down the carbon chain, repositioning the structure that is considered to be responsible for a “citrus note” in structurally similar molecules (e.g. citronellal). The substitution of a silicon atom for a carbon atom within the molecule, likewise produces changes in its scent profile, while making the molecule heavier and thus more persistent. The silicon atom likewise makes the molecule more flexible, allowing it to bend into a more favorable conformation for activating the 3-dimensional profile of the relevant human olfactory receptor, thus producing a stronger odor impression—designing an improved key for the recipient's perceptual-lock system.

Raspet has registered the compound with the CAS (Chemical Abstracts Service) number 1577121-88-0, trade name “Siladroxyllal-014®”. The compound is currently undergoing production under contract with a US company. Following a round of safety tests it will be available to sample on an appointment basis after the opening. Additional documentation is available in the office.



7-hydroxycitronellal



3-[(3-hydroxy-3-methylbutyl)dimethylsilyl]propanal  
 (Siladroxyllal-014®)

Figure 7. 7-hydroxycitronellal and Siladroxyllal-014®

7. Also available in the office is Raspet's patent application for a substance/entity that consists of the difference between Coca-Cola® and PepsiCola® (“A Composition of Matter Consisting of the Difference Between Two Compositions of Matter”) (2012 – 2014) which delineates the resulting substance as a comprehensive formulation.