

Topic Review Sheet: Fragrances and Perfumery

- I. **Importance of Volatile Chemical compounds** found in plant tissues.
 - A. Essential oils and other compounds; terpenes, phenolics, esters, other compounds.
 - B. Need to extract these into non-polar *versus* polar solvents.
 - C. Uses properties of volatility and variation in chemical structure to determine specific useful components of aroma to add together to make desired perfume/fragrance
 - D. Plant parts used: any parts OK, perfumery typically uses floral parts; petals, whole flowers, secretory glands (osmophores); often harvested at peak of scent secretion at full anthesis time.

- II. **Methods of Extraction** of essential oils and other secondary compounds from plant tissues.
 - A. Maceration – Extraction of compounds into hot oil
 - B. Steam Distillation – Use of distillation in presence of water; most commonly used
 1. Fractional distillation can isolate specific compounds; HPLC can also be used
 - C. Tinctures - Dissolving the compounds in alcohol, typically ethanol or methanol.
 - D. Enfleurage - Placing plant parts into rendered pig fat to slowly and delicately remove the fragrances into a non-polar medium.
 - E. Carbon Dioxide Extraction - used more recently; uses liquefied CO₂ to solubilize organic components of plant tissues and chemically manipulate them after concentration.

- III. **Making of Perfumes** – Components of complex mixtures.
 - A. Perfumes are often complex (and highly guarded proprietary) mixtures of various extracts from a range of plant species.
 - B. Different mixtures of compounds made in a 'neutral' carrier solvent; "fixatives" used to slow-down evaporation and dissipation of compounds when in use.
 - C. Compounds are grouped (in general) by class and use in the perfumer's "palette" of scents and aromas:
 1. concretes – purified natural ordants; typically a mixture of essential oils from a single species
 2. absolutes – concentrated and purified extracts forming the major aroma profiles for most perfumes.
 3. distilled/fractionally distilled essential oils (mixtures)
 4. resinoids - extracts obtained from non-floral plant parts: roots, stems, leaves, resins/secretions, seeds
 5. tinctures – alcoholic extracts in partially polar solvents; provides a different aroma profile than concretes/absolutes.

 - D. Extensive sensory testing and focus group analyses are conducted on hundreds of fragrances before any are successful in the highly competitive industry.

Plants often used for Perfumery and Fragrances: Cedar, Cinnamon, Citrus, Clove, Gardenia, Jasmine, Lavender, Pine, Rose, Rosemary, Sage, Vanilla, Violet