

**CONCEPT FOR NOTE BY NOTE COOKING
(MOLECULAR GASTRONOMY)**

POP A DOODLE DO!

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Product concept →

Compound responsible for
the smell: **G é osmine**

Category: Cocktail

Components in the dish:

1. Beverage — representing water
2. Starch sand- Forest soil/ moss
3. Vegetal alginate beads- leaves
4. Fruity alginate beads- fruits
5. Isomalt leaves- broken forest leaves
and twigs
6. Pop candy- *'Singing of the child's
heart'*



Tag Line- *'Bubbles per day keep troubles away'*

Strengths

1. Visually fascinating- *mid suspension of beads*
2. Introducing concept of *'Slurp-n-chew'* with unique flavor burst molecules (Thick Straw)
3. Petrichor: Reminds you of the smell after the rains from the fresh soil (**Geosmin**) that reminds you of your childhood

Weaknesses

1. Defects- **Settling or flotation** of bubbles, **disruption of bubbles** on cooking/ shaking of beverage (*Cloudy beverage*)

Description

A cocktail that reminds you of the time after the rains!

Opportunities

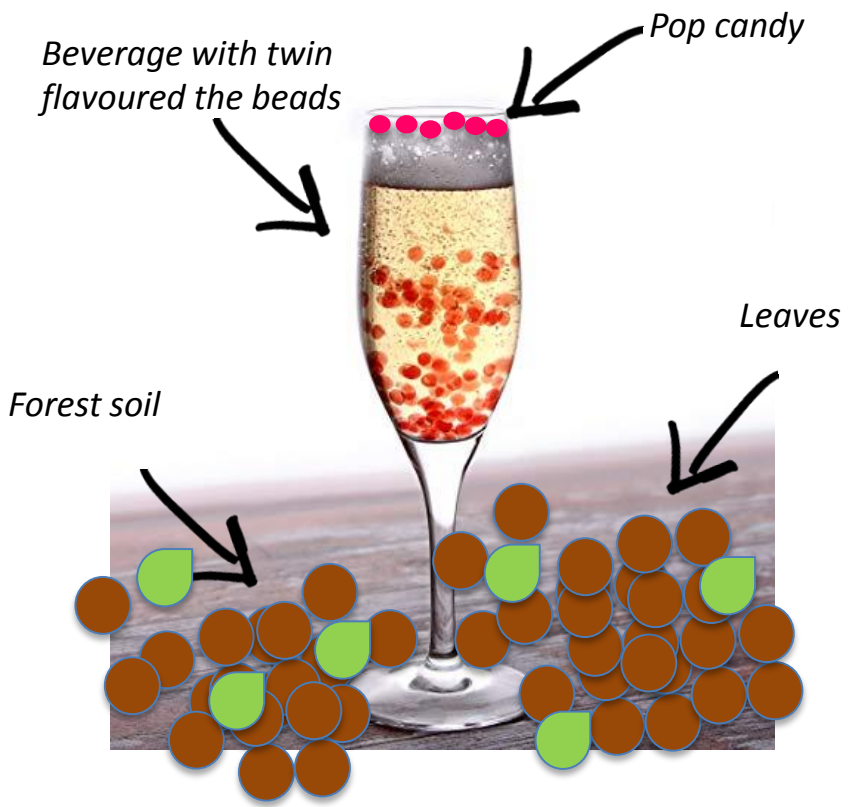
1. Combining **vegetal flavors with soil smell**
2. Different textures of popping candy with the flavor filled alginate beads

Threats

1. **Unacceptable texture/ excessive chewiness** of bubbles/ capsules
2. **Stickiness** of popping candy or isomaltulose forest leaves

Product Picture

State: Cocktail beverage with suspended nutrient dense flavoured gel beads and pop rock candy



Forest soil

Pop candy

Leaves

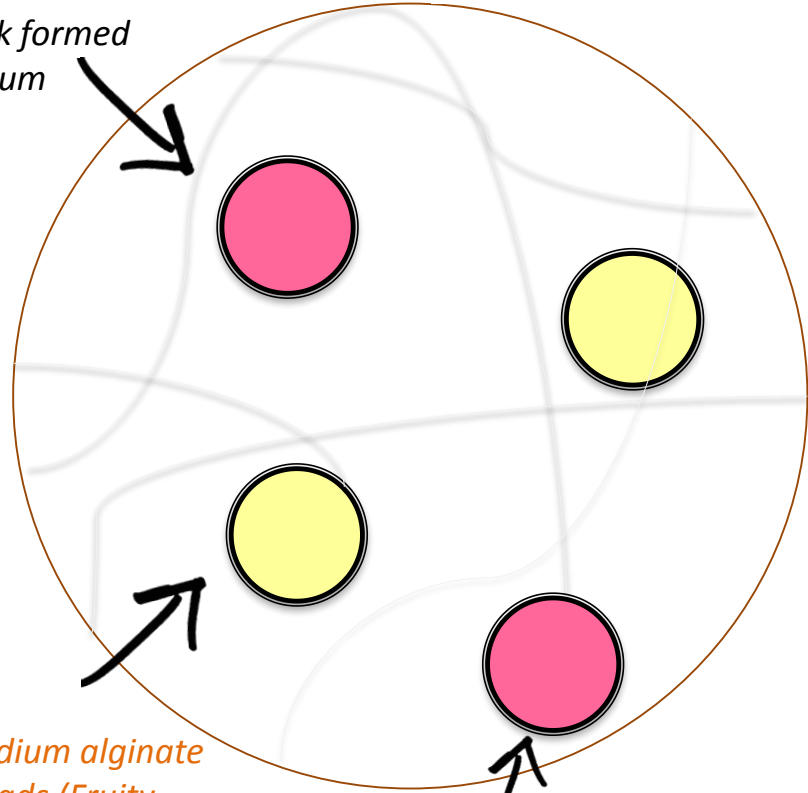
+ Geosmine
sprayed in the air

Macro Scale

GRAVITY-DEFYING THERAPEUTIC BEVERAGE

- VEGETARIAN
- NUT FREE
- GLUTEN FREE
- SEAFOOD FREE
- VEGAN
- CAFFEINE FREE

Gel network formed by Gellan gum



Sodium alginate beads (Fruity flavor- Lyche)

Sodium alginate beads (Vegetal flavor- Hexanal)

Micro Scale

Alginate pearls in water

POP A Doodle Do!

Major Ingredient	Functional properties	Why are you using it in your product ?
<ol style="list-style-type: none"> 1. Na alginate/ Ca alginate 2. Cold oil/ Calcium lactate 3. Gellan gum/ Guar gum/ Acacia gum 4. Span 60/ Tween 60/ Tween 80 	<p><i>Encapsulating agent</i> <i>Gelling polysaccharide</i></p> <p><i>Emulsifying and stabilizing agent</i></p>	<p>Helps forms a stable gel like bead with a liquid centerfill. Gellan gum would help in suspension of the beads.</p>
<ol style="list-style-type: none"> 5. Vegetal flavor for pearls and forest leaves: Hexanal 6. Fruity flavor: Lyche 	<p><i>Aroma, taste and flavor contributing ingredient</i></p>	<p>Source of flavors (Heart of the beverage)</p>
<ol style="list-style-type: none"> 7. Potable water 8. Granulated and/ or powdered sugar 	<p><i>Base for beverage</i> <i>Carbohydrate source and sweetener</i> <i>taste and flavor contributing ingredient.</i></p>	<p>Base liquid that would hold the gellan network and suspended alginate beads by reverse spherification</p>

Main operation units

For Outer Encapsulate

1. Uniform mixing of gums, oil, emulsifiers for a stable encapsulate.
2. Minimize lump formation
3. Extrudable consistency

Unit Operation 1
MIXING

- **Objectives:** Homogeneous mixture with injectable consistency for even coating of center fill to form a gel bead
- **Equipment:** Plastic disposable injection syringe, water bath, magnetic stirrer
- **Conditions:** Room temperature for injection, Water bath trials: 60-80°C

For flavoured center-fill

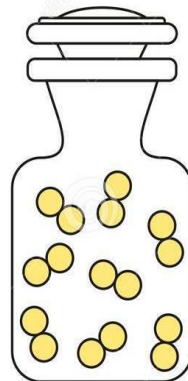
1. Uniform mixing of center-fill ingredients
2. Minimize lump formation
3. Viscous consistency

Unit Operation 2
MIXING

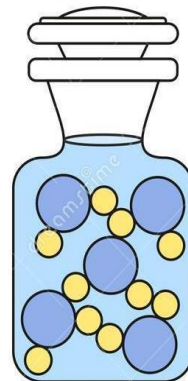
- **Objectives:** Homogeneous mixture with injectable consistency for even center-filling
- **Equipment:** Plastic disposable injection syringe, blender, weighing balance, sieve
- **Conditions:** Room temperature for injection and blending

1. Microscopic interactions between emulsifier, gum and oil for a smooth even encapsulate
2. Size reduction and homogenization of center-fill

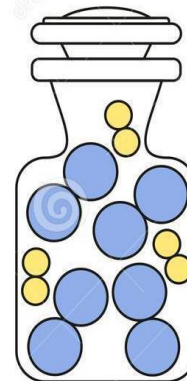
What is happening inside ?



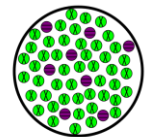
Single compound



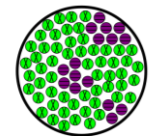
Heterogeneous mixture of the 2 compounds in diluent



Homogeneous mixture



Homogeneous



Heterogeneous

Microscopic structure

Unit Operation
YIELD

80-85 %

Main operation units

Injection extrusion to form stable gel beads

Unit Operation 1
INJECTION EXTRUSION

1. Even coating of encapsulate enclosing center fill
2. Uniform dispersion of center fill

Point of control: Prevent bursting of beads or entrapment of air bubbles that would deform the shape

- **Objectives:** Homogeneous injection of center fill surrounded by encapsulate
- **Equipment:** Plastic disposable injection syringe, magnetic stirrer
- **Conditions:** Room temperature for injection

Final dispersion and suspension of beads in liquid beverage

Unit Operation 2
FINAL MIXING

1. Uniform suspension of beads in beverage

Point of control: Achieve suspension of beads in beverage ('gravity defying concept') than settling, maintain transparency of beverage, ensure that beads don't burst on mild shaking.

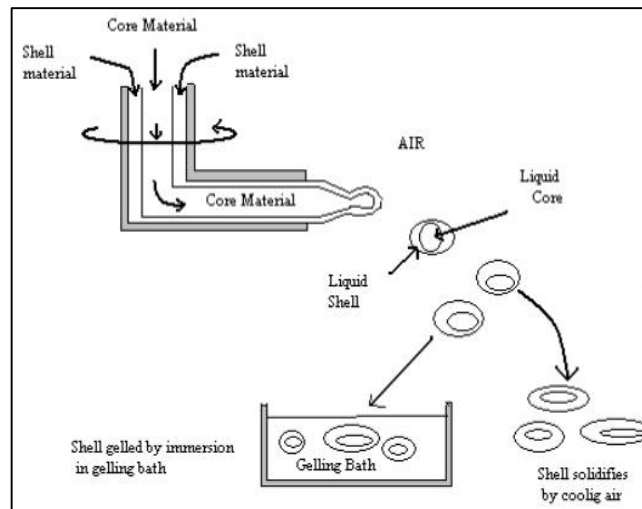
- **Objectives:** Homogeneous mixing of beads and suspension of beads in the liquid beverage
- **Equipment:** manual filling into cocktail glasses, funnels for pouring the gel beads
- **Conditions:** Room temperature for blending

1. Formation of a stable alginate-gum complex which is elastic and would rupture on bursting
2. Suspension of gel beads in gellan gum network in the liquid beverage

Unit Operation
YIELD

75-80%

What is happening inside ?



Preparation of beverage base

- **Ingredients:** Vodka, Water and Gellan gum

Method:

1. Trials would be made to estimate the exact % of gellan gum required to suspend the beads

Preparation of starch sand

- **Ingredients:** Glucose, egg white powder, rice/ corn starch, cocoa butter, vanillin

Method:

1. Toast the starch until golden brown in color. Add the remaining ingredients and homogenize until a sandy like consistency
2. Bake at 220°C for 5-7 minutes and cool

Preparation of alginate beads

- **Ingredients:** Sodium alginate, calcium lactate, sunflower oil, cold water, hexanal, lychee flavor, water

Method:

1. Get the flavored liquid with calcium content from the fridge, the sodium alginate bath and the measuring spoons to make small spheres to resemble peas, caviar etc.
2. Prepare another bowl with plain water that you are going to use later for rinsing the spheres to remove the excess of sodium alginate.
3. Now grab the measuring spoon of the desired size; fill it with the flavored liquid and carefully pour it into the sodium alginate bath. Wipe the bottom with a paper towel, place the spoon over the bath slightly touching its surface and flip it to pour the liquid into the sodium alginate bath.
4. Stir the bath gently with the slotted spoon without touching the spheres. If you let them sit in the bottom of the bath, they will flatten and if you let them float, the top won't be covered with the sodium alginate solution and won't gel. Make sure the spheres don't touch each other or they will stick. Start with one sphere at a time until you get used to the process.
5. Wait for about 2 minutes. The longer you wait the thicker the gel that will form. In general, for a good eating experience, you want the gel layer surrounding the sphere to be as thin as possible but it also needs to be strong enough to hold the shape and allow for careful handling. If the membrane is too fragile, they may easily break when you remove them from the bath or place them on the serving spoon.
6. Carefully remove the sphere from the sodium alginate bath using a slotted spoon and rinse it in the bowl with clean water.

TIPS: It is recommended to always start with one sphere first to adjust the pouring process and the time in the sodium alginate bath. If the sphere membrane is too subtle and the sphere easily breaks when handling it with the slotted spoon carefully or when plating it, extend the time in the calcium bath until you get the desired strength.

Keep in mind that the thinner the membrane the better experience people are going to have when eating it.

Preparation of Isomalt leaves

- **Ingredients:** Granular Isomalt, water, oil

Method:

1. Combine 4 parts Isomalt to 1 part water
2. Stir over medium heat until mix dissolves and all crystals are incorporated.
3. Cover the saucepan and boil for 4 minutes.
4. Remove the cover, insert a candy thermometer and cook without stirring until the temperature reaches 320° F.
5. Remove from heat when temperature reaches 320°F.
6. When adding colors, first allow cooked Isomalt to cool undisturbed for 5-10 minutes.
7. Pour onto oiled marble slab, prepared cookie sheet, Silpat Mat, or into molds.
8. Allow candy to cool completely. Do not refrigerate.

Preparation of Popping candy

- **Ingredients:** 3 tablespoons confectioners' sugar, 1 1/2 teaspoons baking soda, 1/4 cup plus 2 teaspoons citric acid, divided; 2 cups granulated sugar, 1/3 cup honey, 1/3 cup water, pink food coloring and flavouring (*Strawberry*)

Method:

1. Dust the bottom of a rimmed baking sheet with the confectioners' sugar. Be sure to coat the surface.
2. Combine the baking soda and 1/4 cup of the citric acid in a small bowl, and mix gently to combine. Set to the side.
3. Place the sugar, honey and water in the pan. Stir to combine. Place the mixture over medium heat. The mixture will progress from quite sandy to liquid to vigorously bubbling. Once it starts bubbling, start monitoring the temperature closely. When the mixture reaches between 295 and 300 F, remove from heat.
4. Immediately stir in the baking soda and citric acid mixture and the food coloring. Whisk until everything is combined. Work quickly, as the candy will begin to set rapidly.
5. Pour the candy on to the prepared baking sheet. Try to pour so that the sheet is evenly coated. Sprinkle the top of the candy with the remaining citric acid right after spreading (as it won't stick once the candy sets).
6. Break the candy into large shards to make it easier to handle, and transfer it to a large freezer bag (or divide it between two bags). Force out any extra air and seal the bag(s).
7. Gently roll a rolling pin over the candy mixture to crush in into small pieces.

References

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- <https://www.cakecentral.com/tutorial/39652/make-isomalt-acorns-wafer-paper-leaves>
- <http://www.molecularrecipes.com/spherification-class/reverse-spherification/>
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