Soy Sauce “Caviar” Pearls

A Brief History and Step-by-Step Guide of Spherification

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The scientific name for making Soy Sauce “Caviar” Pearls is Spherification

There are four principal techniques in Molecular Gastronomy[1]

Spherification Emulsification Gelification Sous Vide

[1] Molecular Gastronomy is the scientific approach of cuisine from primarily the perspective of chemistry.

Embraced by world-class chefs in the late 1990's and early 2000's, Molecular Gastronomy was considered the pinnacle of fine dining. While some of the techniques are used today, they are less popular. When chefs talk "molecular" today, they typically use the term Modernist Cuisine.

Heston Blumenthal

Grant Achatz

José Andrés

Ferran Adrià

Thomas Keller

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How Spherification Works

Spherification is an 80-year-old molecular technique that transforms liquid into spheres by encapsulating the liquid within a thin, edible gel membrane. Spherification is taught in culinary schools around the world.

The traditional method uses sodium alginate and calcium chloride to form the gel and membrane. Due to the low pH and other attributes of soy sauce, and even lower pH of ponzu, we used agar[1] to gel the soy sauce and cold oil to form the membrane.

The step-by-step method follows:

[1] Agar is a plant-based substitute for gelatin.

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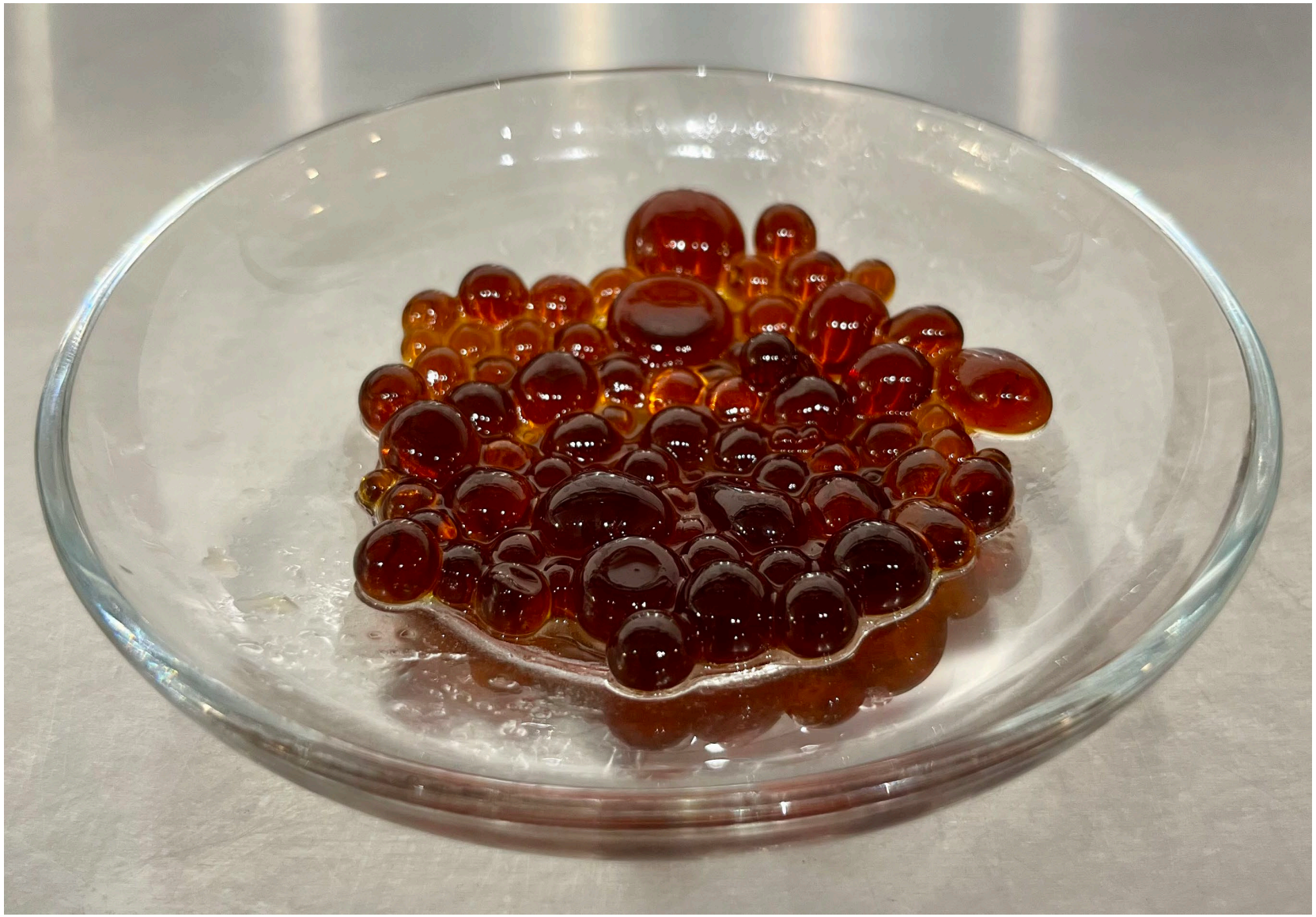
Finished “Caviar” Pearls



“Caviar” Pearls

Equipment

Ingredients

Infusion

Soy sauce is infused with ingredients of choice to make a “flavorful liquid”. Ponzus and other Kikkoman products can be included in the “flavorful liquid”.

After infusing, any particulates are strained. In this case we used kombu and bonito, which enhanced the umami and also added a slight sticky viscosity.

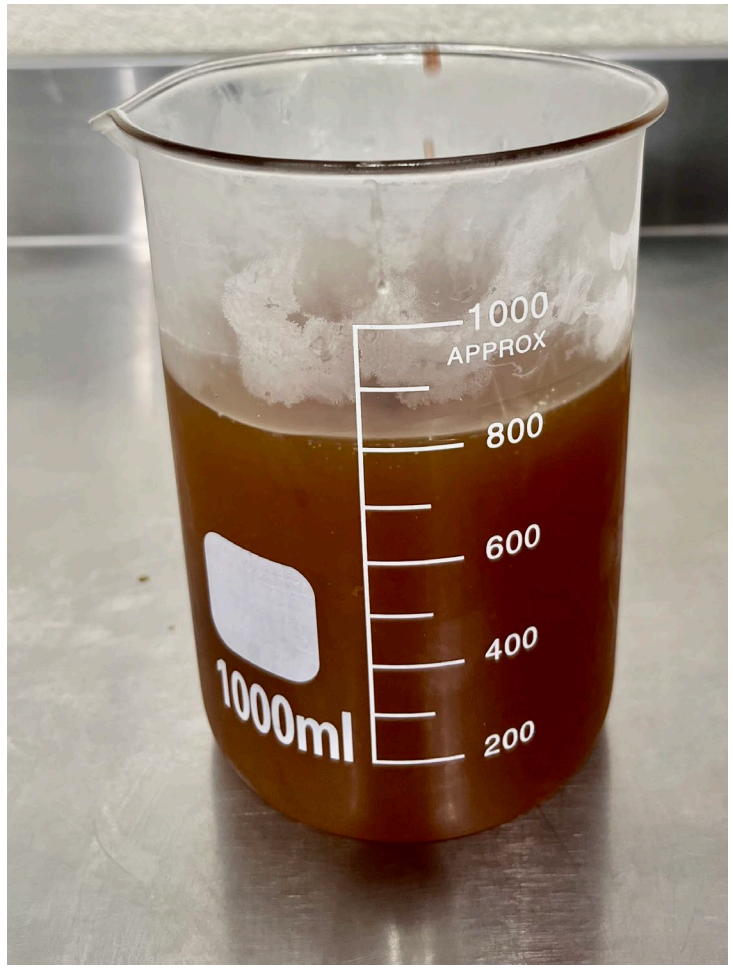
Gelification

The strained infusion is added to a saucepan, whisked to create a vortex, and agar is added to form a liquid gel.

The infusion is heated gradually with constant whisking to 185° F (85° C).

The infusion is then cooled to 122° F (50° C). At this point quick action is necessary or a complete gel will set.

Oil Membrane



Any oil can be used to form the membrane. I combined peanut and sesame oils for flavor. At this point, the oil is transferred to a tall glass vessel, preferably a 1000 ml science beaker, and placed in the freezer to a near frozen state 40°F (4° C) .

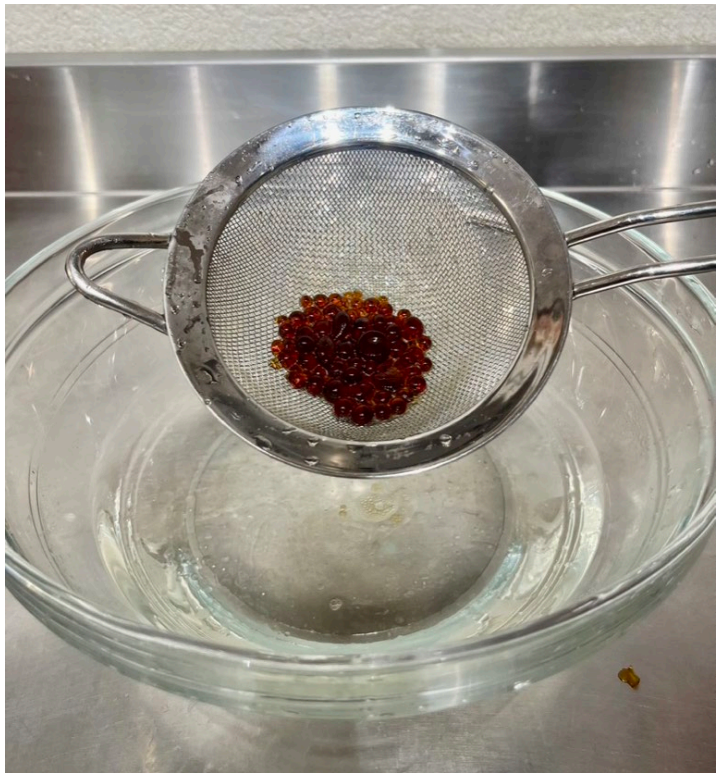
Forming the Spheres

The 122° F (50° C) flavorful liquid is transferred to a dropper. We used a syringe created for this purpose. A squeeze bottle can also be used.

The flavorful liquid is dropped into 40°F (4° C) Oil. It is very important for the oil to be very cold and be in a tall glass vessel, so the droplets have time to become circular and form a membrane as they drop to the bottom.

The oil is poured through a fine sieve to capture the “Caviar” Pearls. Reserve the oil for future use. The sieve is then dipped into fresh ice- cold water to rinse.

The “Caviar” Pearls’ size will vary based on the dropper used. The variance is preferred, similar to how fish eggs vary in size. Each pearl being slightly different in size, shape and color add to the beauty, mouthfeel and intensity of flavor.



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