

# The hand that can “drink tea”

## ---- Which has the great charm like the grapefruit

HouKong Middle School, Macau  
AUTHOR: WEN CHI WAI, LOI PEK I, LI DALESUN

### Research Background :

In daily life, our hands keep contact with the external environment, whether it is laundry, cooking, cleaning, or the cold air in autumn and winter, will make the skin of the hands become dry, rough, fine lines, appear very old, serious will also lead to the knuckles calluses, or even chapped. Therefore, we want to develop a cream hand care product that can be highly moisturizing, antioxidant, light spots and firm skin.

### Description of the product:

#### Materials:

Shea butter oil, glycerol, emulsifier, Phenoxyethanol, 70ml of distilled water, grapefruit peel (5~10 drops of grapefruit peel essential oil).

#### Instrument:

Juicer, centrifuge, electronic scale, electric mixer, 250ml beaker, rubber head dropper.

### The principle of design:

(a) Compression method: using the pressure to break up the cells of the raw material. When the raw material is pressed, the extracted oil is diverted. The oil is purified by centrifuge or standing method to essential oil.

(b) Emulsification: surface active with emulsification. After the surfactant, due to the nature of the surfactant can make the oil with the water. It produces affinity, reduces the interface tension and changes the mediator face state, making it impossible to mix together the oil and water. Two liquids can be mixed together, and one phase is the liquid. It will be discrete into many small particles, dispersed in another phase of the liquid. Form an emulsion.

### Analysis of materials:

#### ● Grapefruit skin

Grapefruit skin accounts for 43%~48% of whole grapefruit, besides the essential nutrients that contain moisture, vitamin, mineral

these human body, still contain a variety of non-nutritional physiological active ingredients that are beneficial to human health, such as essential oil.

Grapefruit peel extract is rich in terpenoid active substances, such as dlimonene, laurel ene and chun-linalool, etc., with anti-oxidation, antimicrobial, anti-aging and other activities, can be used in beauty makeup and skin care products, has a high value!

- **Shea butter**

Shea butter is a vegetable oil extracted from the nuts of the unique African plant —— Shea butter. Its appearance is ivory color, and its chemical composition is mainly composed of triaric acid derived from stearic acid and oleic acid. Shea butter can melt at body temperature. For skin care, it can be quickly absorbed into the skin, acting as a "recycled fat", and has a good combination with water, so that it is used for the maintenance of the skin.

The benefits are specific and are as follows,

1. Suitable for skin absorption: Shea butter is a pure natural vegetable oil, mild and unstimulating, even sensitive skin is very suitable for use, and very similar to the oil secreted by the human body, which is easy for our skin to absorb.
2. Moisturizing: it contains a lot of oil and non-saponification repair ingredients, which can prevent dryness and cracking, and also provide deep moisturizing effect, so that the skin maintains a natural and tender state.
3. Natural protection: the vegetable oil contained in it can stay on the skin surface, create a natural protective layer for the skin, isolate the external stimulation, but also reduce the loss of water in the skin.
4. Prevent skin aging: it contains A large number of non-saponified ingredients and rich vitamin A, D, E, F, which can supplement enough nutrients for the skin, help the bone collagen in the skin dermis, promote epidermal cell regeneration and avoid aging.

- **Glycerol Principle:**

Glycerol, namely moisturizing agent, its water absorption is very good, can absorb the moisture in the air, make our skin keep moist. Wide range of people: it is almost not irritating to the skin, so people with sensitive muscles can also use it. Environmental protection: biodegradable. When placed in a natural environment, it breaks down into the water, with negligible amounts in the air, soil, or sediments.

- **Emulsifier :**

Principle and action: make the mixture of two or more insoluble components to form a stable emulsion, whose main function is to reduce the interface tension between two systems that cannot be mixed. In this experiment, the emulsifier mixed the oil and aqueous phase evenly.

● Phenoxyethanol:

It is a phenolic ether organic compound, colorless oil, antibacterial and disinfection effect (for bacteria, mold and yeast, especially for gram-negative bacteria), in the hand cream as a preservative and antibacterial, to prolong the use time of hand cream. And it is relatively safe, for pregnant women generally have no impact.

The process of making:

(a) Process of making hand protection product:

- i. Make the oil phase part: 250g shea butter + 5ml glycerol + 1.25ml emulsifier
- ii. Make the water phase part: 70ml distilled water + 4 drops of phenoxyethanol
- iii. Dissolve the oil phase: heat the beaker with the oil phase in water and stir
- IV. Mix the oil phase with the water phase: Pour all the water phase into the beaker with the oil phase and stir until it is thick and smooth.
- v. Finally, add the essential oil, done!

(b) Extraction of grapefruit peel essential oil:

- I. Wash: Soak the whole grapefruit in clean water, wash, and then remove the water
- II. Peel: Peel off the grapefruit with a knife
- III. Press: Put the peel into the juicer and press it to get the grapefruit peel pulp
- IV. Sever: Separate the grapefruit peel pulp with a centrifuge
- V. Get: After centrifugation, the top layer is grapefruit essential oil

Innovation points / Advantages:

Turn waste into treasure: grapefruit peel contains a variety of beneficial ingredients to human health, so we want to use the waste product fully to play a variety of properties of grapefruit peel and improve the use value and economic effect of grapefruit peel.

The materials are mostly natural, safe and reassuring: The Essential oil is extracted from the grapefruit peel, so it is not harmful to the human body; Shea butter oil is a kind of vegetable oil extracted from

the nuts of the endemic African plant — — shea butter tree. It is safe, non-toxic and has high nutritional value, and is widely used in cosmetics.

Environmental protection, but also for natural degradation: The material — — glycerin, used in this product, is biodegradable, it will decompose in the water, and there is no harm to the natural environment.

Further improvement/ Research content:

First of all, the use of chemical ingredients should be appropriate, excessive and harmful to the erosion of the skin, should pay attention to protect the body skin, try to choose plant-derived moisturizing ingredients.

Secondly, according to the characteristics of different skin types, we will study the production formula of different proportions, and allocate different skin types with different effects and different benefits.

Finally, because most users use hand cream during the day, we think that SPF ingredients can be added to the product to play a certain sunscreen effect, better protect the skin, and it is more suitable for the needs of people nowadays