

Antioxidant activity and irritation test of peel off gel mask of pure palm oil as emollient

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Abstract. Pure palm oil comes from CPO or crude oil that has been purified and has the chemical content of tocopherols and tootrienols as antioxidants and glycerol as emollients. Therefore pure palm oil is used as a cosmetic product, one of them is peel off gel mask. This study aims to determine antioxidant activity, level of irritation and moisture content of the skin after using a peel off gel mask. Pure palm oil used in the peel off gel mask formulation with a concentration of 1% with a carbomer 940 base. peel off mask test included irritation test, antioxidant activity test and skin moisture test with skin analyzer. Descriptively produced data states that peel off gel pure palm oil mask with carbomer 940 base does not cause irritation and is safe for use with IC50 values of 173.09 and potential for weak antioxidant activity. the value of water content on the skin after the use of a mask is 56,3% with the category moist skin doesnot exceed 46 %.

Keywords : pure palm oil, antioxidant, irritation, emollient

1 Introduction

The human body is now very susceptible to the influence of free radicals originating from ultraviolet light, motor smoke, food preservatives and so on. If free radicals have been formed in the body there will be a chain reaction and produce new free radicals that accumulate in large numbers and will attack the body's cells so that various diseases occur and irreversible skin aging[5].

One of the natural ingredients that can counteract free radicals is pure palm oil derived from CPO (Crude Palm Oil) or purified crude oil that has the chemical content of tocopherols and tootrienols as antioxidants. Besides that, pure palm oil also contains glycerol as an

emollient or moisturizer that is easily absorbed by the skin [4].

Therefore, pure palm oil is used as a cosmetic product, one of them is peel off gel mask. Gel-shaped peel-off masks have several advantages including practical use, easy to clean and can be removed like elastic membranes. Peel off gel mask has a high water content, so it will give a cold and moist feeling to the face with dry skin. Peel off gel masks can be absorbed by the horn layer, even though the mask dries, the horn layer remains supple and after the mask is removed it appears that the wrinkles of the skin are reduced so that the face is not only smooth but also tight [2].

In the process of making gel peel off mask, a base for gelling agent is needed which is added to a formula. The gelling agent used must be neutral, safe especially for the skin and not react with other ingredients in a formula. One base gel that can be used is a group of

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synthetic polymers such as carbomer 940 (carbopol) [8]. By using the gelling agent carbomer 940 the resulting mass of gel will provide a good, clear, and not cloudy form and appearance [3]

2 Methodology

2.1 Research Materials

The most commonly used are pure palm oil, carbomer 940, disodium EDTA, propylene glycol, HPMC,

potassium sorbate, polysorbate 80, 2N NaOH, aquadest, DPPH, methanol, adhesive tape. Research Tools

Equipment used for mortar and stamper, stirring rod, porcelain cup, glass beaker, measuring cup, drop pipette, volume pipette, vial, test tube, weighing scale, pH meter, thermometer, digital scales, oven, refrigerator, viscometer cone and plate, stopwatch, cuvette, UV Vis spectrophotometer. Skin analyzer. Formula Design

Table 1. Peel Off Gel Mask Formula

MATERIALS	Formula (%b/b)	PURPOSE
Crude palm oil	1	Active substance
Carbomer 940	0,5	Gelling agent
Disodium EDTA	0,1	Chelating agent
Propylene glycol	3	Humectan
HPMC	4,5	Film Forming
Potassium Sorbate	0,1	Preservatives
Polisorbate 80	1	Cleansing agent
NaOH 2 N	0,3	Alkalinizing agent
Aquadest ad	100	Solvent

2.2 Making Peel Off Gel Masks

HPMC was developed in cold distilled water, then added to room temperature distilled water to expand (mass 1). In a separate container Carbomer 940 was developed in distilled water for 24 hours, then based with 2N NaOH (massa 2). Potassium sorbate and EDTA disodium dissolved in distilled water (mass 3). In carbomer 940 which has been inflated, the mass 1 and 3 are added, homogeneously ground and then added propylene glycol and homogenized. Polysorbate 80 was added and then homogenized with slow stirring. After homogeneous gel base will be formed, then finally added pure palm oil little by little into the gel base, ground homogeneously.

2.3 Irritation test

Taken a small sample of the formula preparation of peel-off gel mask and then applied to the skin of the sleeve coated with oil paper then covered with adhesive tape for 24 hours. After 24 hours adhesive tape was opened, left open for 15 minutes and observed irritation reactions in the form of heat, itching, or pain, then recorded. Observations were made on 10 women aged 20-30 years [6].

2.4 Emollient test

Skin moisture test was tested with a skin analyzer. Observations were made on 10 women aged 20-30 years [6]. Where the skin of the panelist's hands before applying the gel peel off mask is tested for the moisture of the skin with a skin analyzer, the percentage of water content is recorded, then compared the percentage of water content after 15 minutes of using peel off gel mask. If there is an increase in the percentage of water content, the preparation has effectiveness as a skin moisturizer if there is no increase in the percentage of water content, the preparation has no effectiveness as a skin moisturizer.

2.5 Antioxidant Activity Test of Peel Off Gel Mask

A total of 25 mg of the preparation was dissolved with methanol pa in a 25 ml volumetric flask then stirred until homogeneous to make 1000 ppm mother liquor. After that, several series of solution concentration were prepared from 1000 ppm mother liquor. Mix 2 ml of each solution of the peel off gel mask with 2 ml DPPH which has been dissolved with methanol, homogenized, then stored in a dark room for 30 minutes. Then the absorbance of the solution was measured at a

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wavelength of 516 nm using a UV-Vis spectrophotometer.

Effectiveness evaluation of gel peel off mask

The evaluation of the effectiveness of peel-off gel mask includes irritation test, skin moisture test or emollient test and antioxidant activity test.

Table 2. Recapitulation of the evaluation of the effectiveness of the preparation

Characterization	Result	Parameter
Irritation test	Negative 100 % (non-irritant)	No reaction (-), skin redness (+), reddish skin and itching (++) , swollen skin (+++) (Voight, 1995: MOH RI, 1985)
Skin moisture test	Before giving 46% sample (moist skin) After giving the sample: 56.7% (very moist skin)	<33% (very dry skin), 34-37% (dry skin), 38-42% (normal skin), 43-46% (moist skin) > 46% (very moist skin) (Stawiski, 1994)
Antioxidant activity	IC 50 = 173.09 ppm	Very strong <50 ppm Strong 50-100 ppm It's 101-150 ppm Weak > 150 ppm (Kresnawaty et al, 2012)

3 Results and Discussion

3.1 Irritation test

Irritation test was carried out on 10 women aged 20-30 years. The attachment of the test material is carried out on the arm closed (patch test). The results of the irritation test showed that none of the 10 panelists experienced skin irritation or redness after using a peel off gel mask, which means that the formula for peel off gel mask with a carbomer 940 base is safe for use.

3.2 Skin Moisture Test (Emollient)

Skin moisture test was tested with a skin analyzer. Observations were made on 10 women aged 20-30 years [1,6]. Where the skin of the panelist's hands before applying the gel peel off mask is checked the water content and obtained results with 46% moisture content (moist skin category) then applied with peel off gel mask. It was allowed to stand for 15 minutes and then removed and tested for water content, it was obtained an increase in water content by 56.7% (very humid category), this meant that the peel off gel mask from pure palm oil had high emollient effectiveness.

3.3 Activity Test of Antioxidant Mask of Peel Off Gel

The value of antioxidant activity using DPPH method is stated with IC50. The greater the IC50 value, the antioxidant activity is classified as weak, whereas if the IC50 value is small then the size of the antioxidant activity is strong.

Table 5. Level of antioxidant strength with DPPH method

Antioxidant Level	IC ₅₀ (ppm)
Very strong	< 50
Strong	50-100
Average	101-150
Weak	> 150

Antioxidant activity testing was carried out on the preparation of peel off gel mask of pure palm oil on a carbomer 940 basis with a comparison of vitamin C. The IC50 value of peel gel mask preparation ranged from 173.09 ppm The antioxidant strength of the peel off gel mask was weak (IC50 = 151-200 ppm). While the IC50 value of vitamin C is 7.248 ppm which means

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that the antioxidant power of vitamin C is included in very powerful antioxidants. The antioxidant activity of the peel off gel mask is lower than that of vitamin C.

Conclusion

Descriptively produced data states that peel off gel pure palm oil mask with Carbomer 940 base does not experience irritation and is safe for use, IC50 value 173.09 with the potential to have weak antioxidant activity and moisture content on the skin after the use of peel off gel mask experienced an increase of 56.7% in the category of very moist skin due to water content of more than 46%.

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