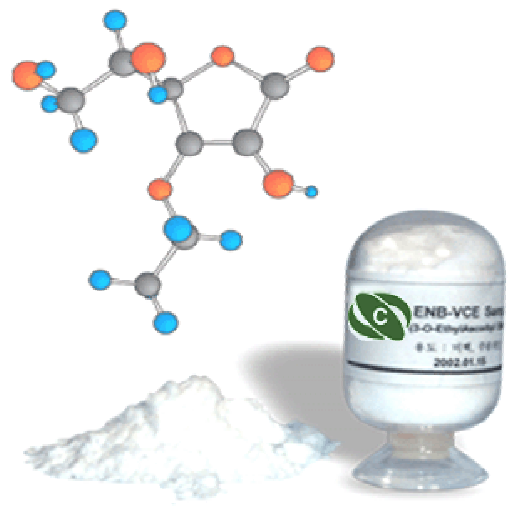
ENB-VCE

3-0-Ethylascorbyl Ether



Presented by

BEOM-ZOO LEE

Director of CHEMLAND CO., LTD.

CHEMLAND

Index

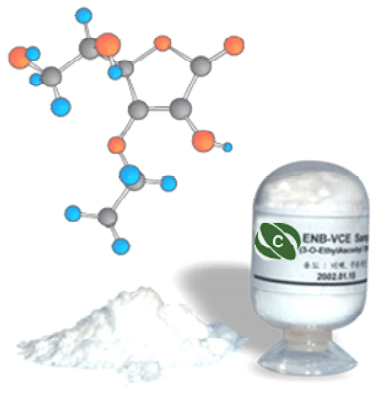
I. INTRODUCTION

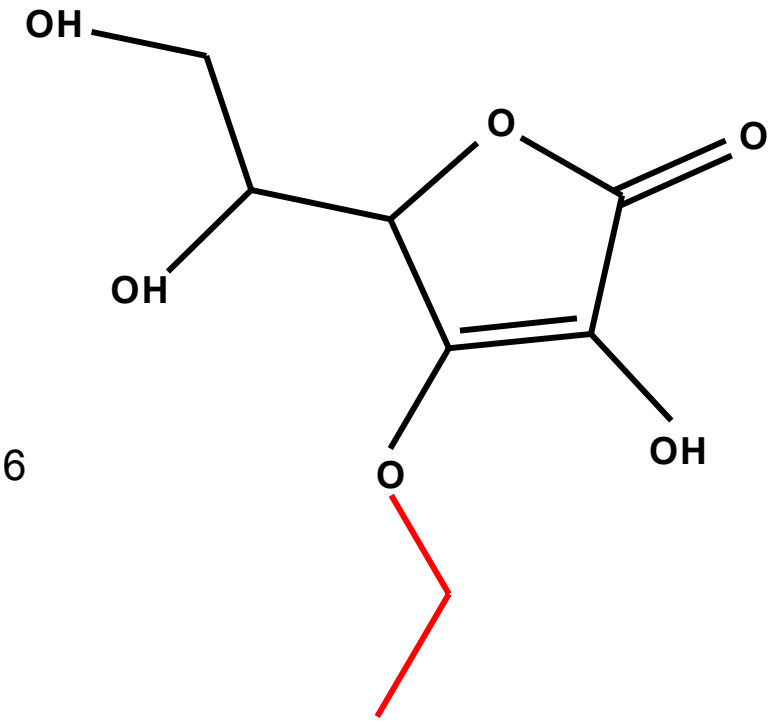
1. Name

- INCI Name: Ethyl ascorbic acid
- 3-*O*-Ethyl Ascorbyl Ether
- 3-*O*-Ethyl Ascorbic Acid
- Vitamin C Ethyl

I. INTRODUCTION

2. Structure





- Molecular formula : $C_8H_{12}O_6$
- CAS No.: 86404-04-8
- Molecular weight : 204.18
- Vitamin-C content : 86.3 %

I. INTRODUCTION

3. Stability

Conventional Vitamin C is easily oxidized and destroyed by heat, air, light, etc. Especially, when it is mixed with other cosmetics which needs to be stored long time. Vitamin C usually causes the problem of color change in cosmetic products.

In the other hand, Vitamin C ethyl is free from the those unstabilities.

Vitamin C Ethyl is stable because it is metabolized as pure vitamin c in the living body.

This vitamin Ethyl C is stable whereas conventional vitamin C has a weakness that it is expedited to be oxidized in a normal subacid.

In the structure of Vitamin C, Vitamin C Ethyl replaces Ethoxy group in the 3rd place which has strong acid. Vitamin C Ethyl is protected from the metal ion. As a result it doesn't change in its color and has nor abnormal reaction.

2001 : permitted as a whitening functional material from Korea Food and Drug Administration

2003 : permitted as a QUASI-DRUGS from JFDA

II. Characteristics

- Stabilized L-ascorbic acid (Vitamin C).
- white, odorless, crystallized powder
- Similar effect with L-ascorbic acid

III. EFFECTIVENESS

- Whitening
- Synthesis of Collagen
- Good Penetration

- Decrease the formation of Melanocyte
- Excellent anti-ageing effect-Recover from:
  - Sun-damage
  - Discoloration
  - Dark spots

III. EFFECTIVENESS

1-2. Whitening Effect *(Cell Test)*

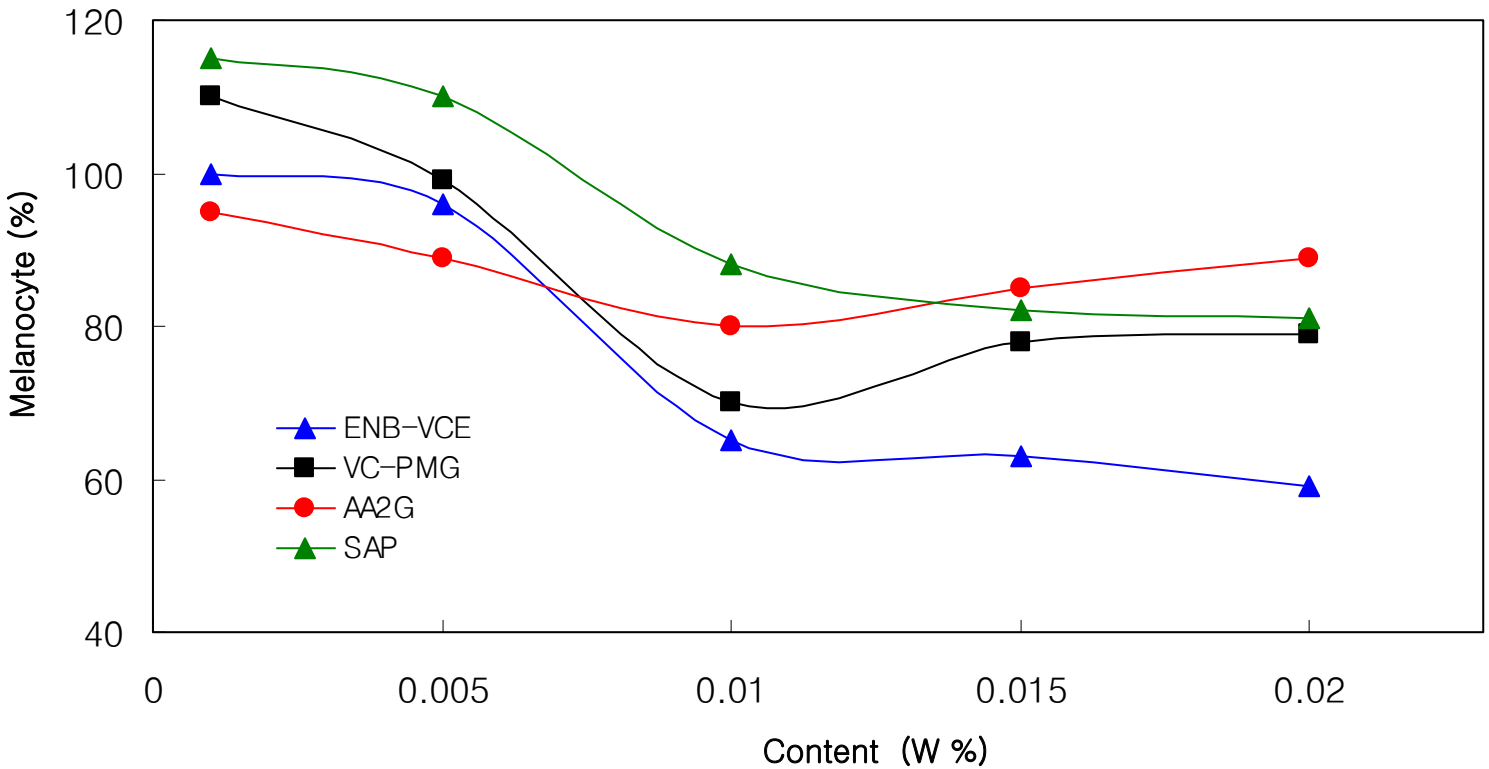


Fig.1 Whitening Test by Melanocyte

III. EFFECTIVENESS

1-3. Whitening Effect (Photograph)

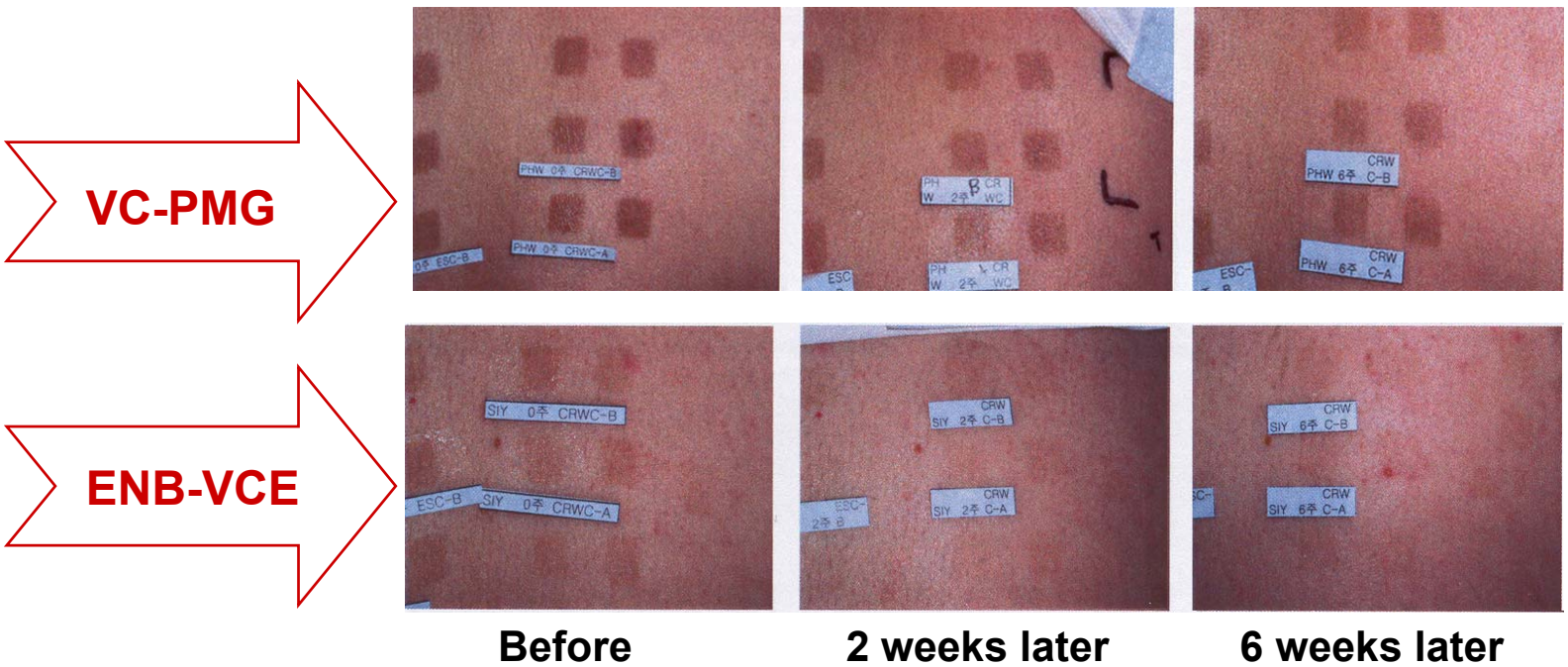


Fig. 3 Whitening Test (Using 0.7 MED UV Ray)

III. EFFECTIVENESS

1-4. Whitening Effect ***(Chromameter Test)***

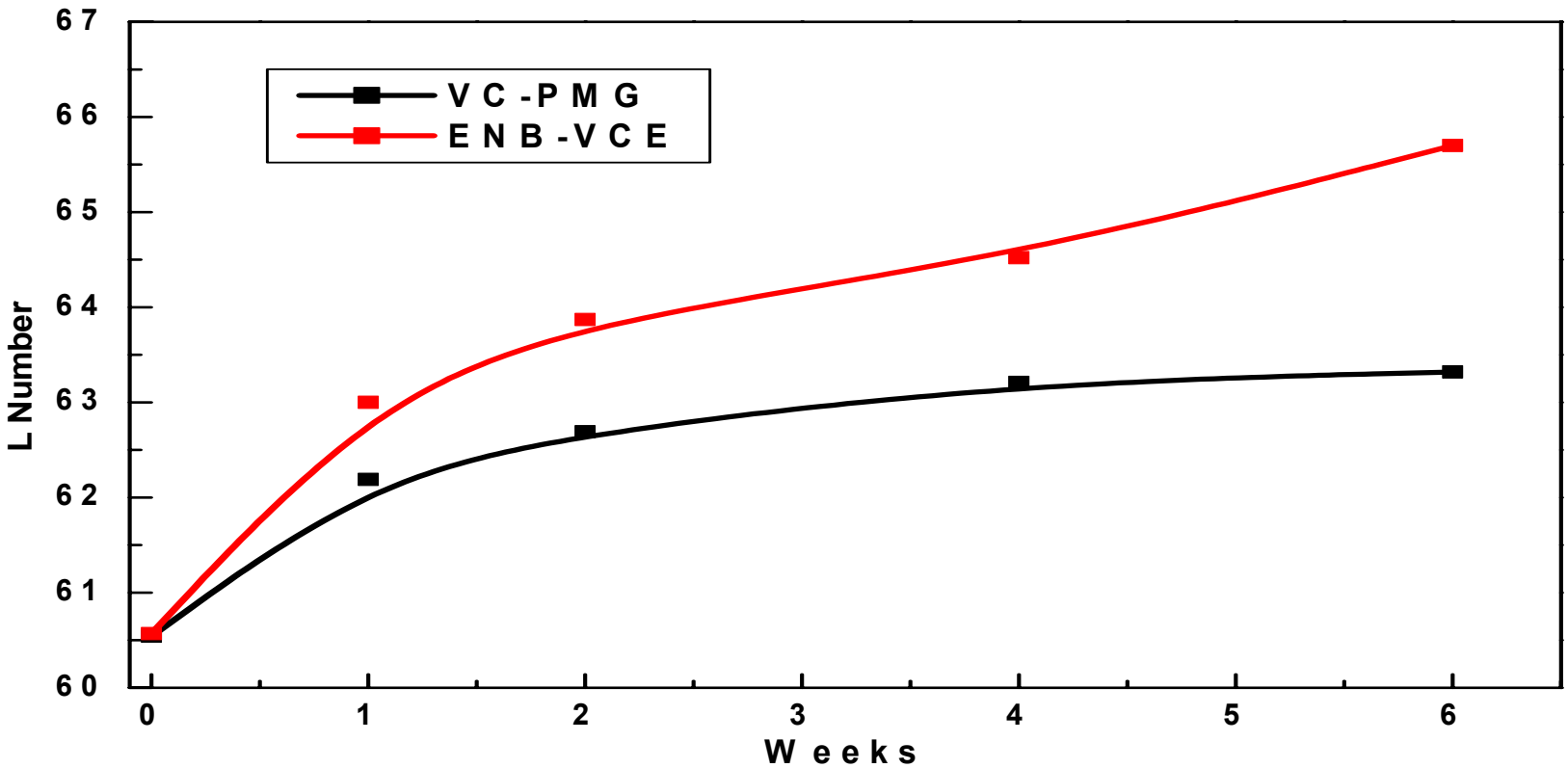


Fig.2 Whitening Test (In Vivo) by Chromameter CR-300

III. EFFECTIVENESS

1-5. Comparision Whitening effect with other Vitamin C Derivatives

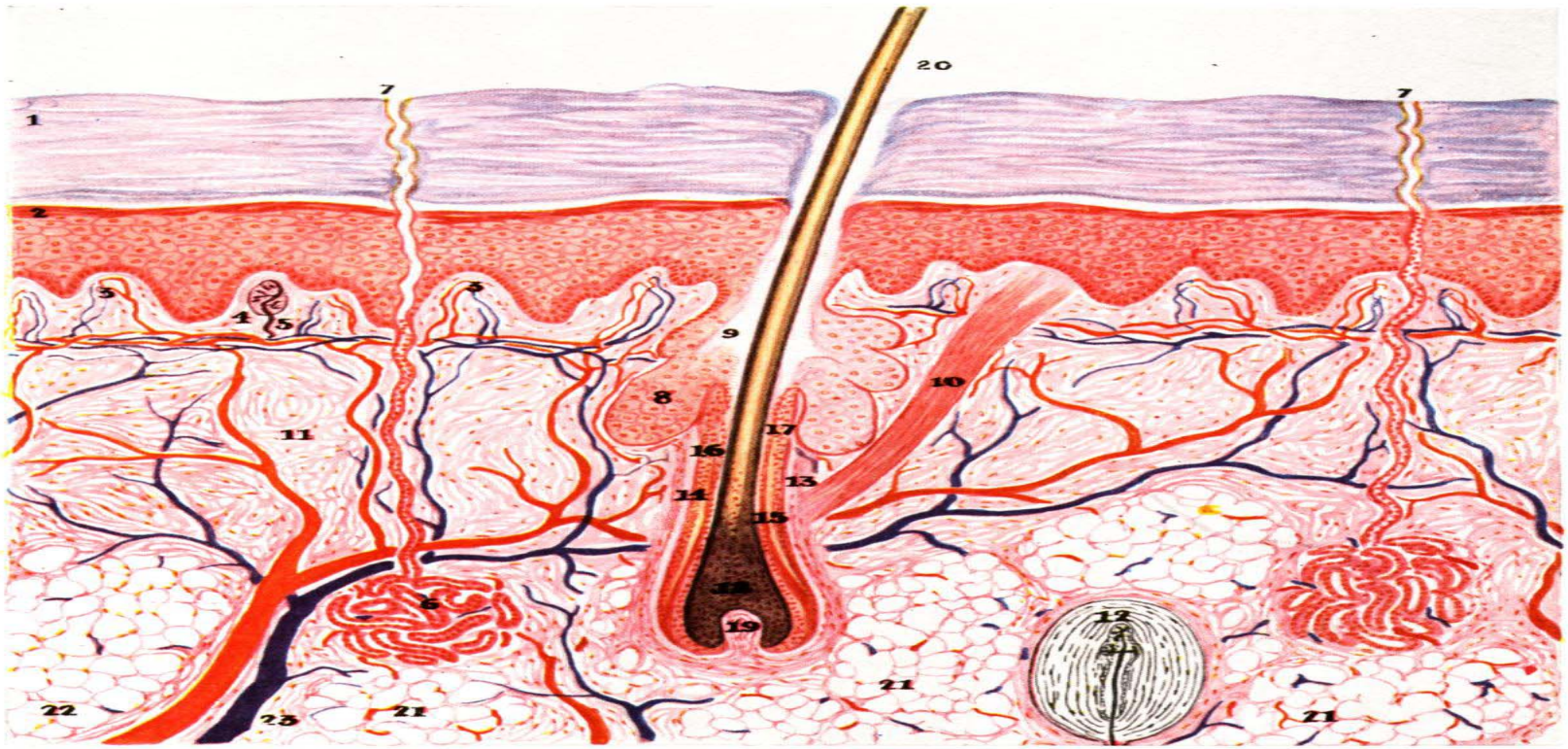
Tested substance	Sample concentration(%)	Rate of inhibition of UV-introduced melanization of DHICA(%)
Ascorbic acid (vitamin-C)	0.1	70
VC – PMG	0.1	20
AA - 2G	0.1	20
Ethly ascorbyl ether	0.1	80
Ethly ascorbyl ether	0.01	40

- VC-PMG : Magnesium-L-Ascorbly-2-Phosphate
- AA-2G : Ascorbate-2-O-Glucoside

- Helps Collagen synthesis
- Recover damaged Collagen
- Reduces the Copper Ion of Tyrosinase

III. EFFECTIVENESS

2-2. *Skin Penetration of a Cream containing ENB-VCE*



1. Epidermis
2. Granular Pigmented Layer
3. Papillæ with Blood Vessels
4. Papilla with Touch Organs
5. Nerve Fibers
6. Sweat Glands
7. Outer openings Sweat Glands
8. Sebaceous Gland
9. Sebaceous Duct
10. Hair Muscles
11. Connective Tissue Fibers
12. Pacinian Corpuscle
13. Hair Follicle
14. Outer Sheath of Hair
15. Inner Sheath of Hair
16. Outside of Hair
17. Core of Hair
18. Bulb of Hair
19. Papillæ at root of Hair
20. Shaft of Hair
21. Adipose (fatty) Tissue Cells
22. Arteries
23. Veins

III. EFFECTIVENESS

2-3. Penetration into Skin

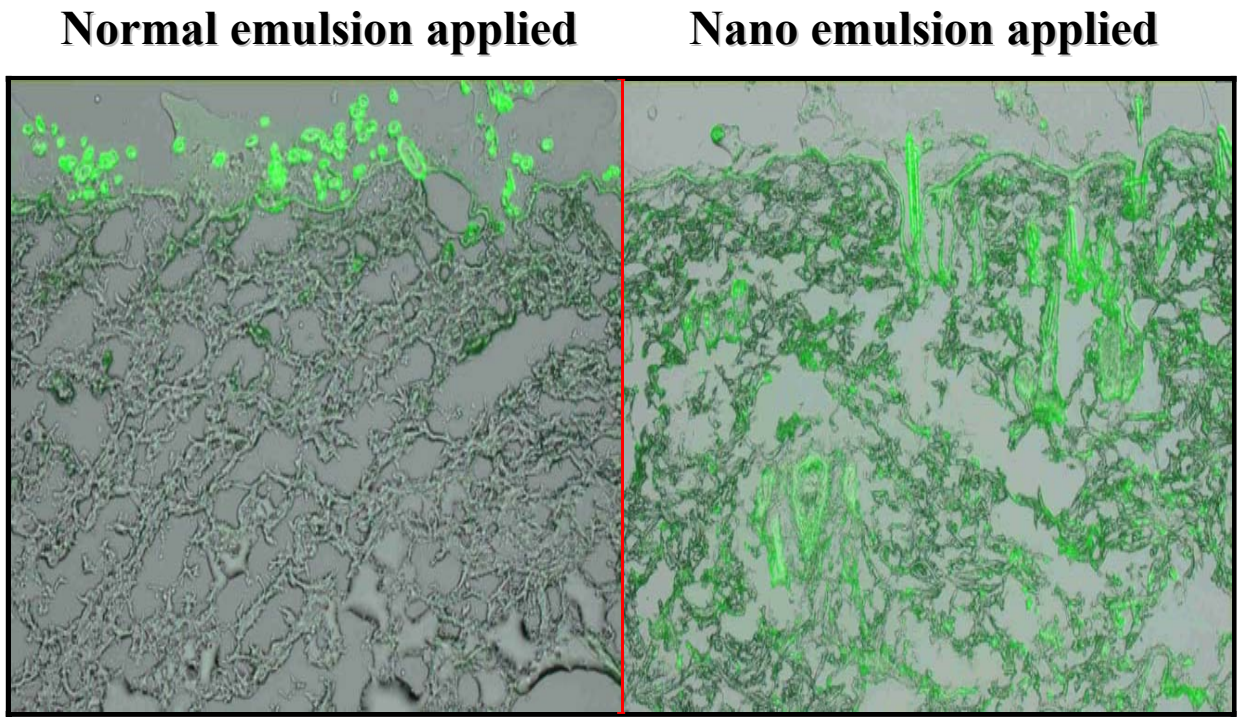


Fig. 4 The result of penetration of calcein cream into skin of rat by OECD Guide line TG 428 (12 hr later after spreading cream)

III. EFFECTIVENESS

2-4. Formation & Synthesis of Collagen

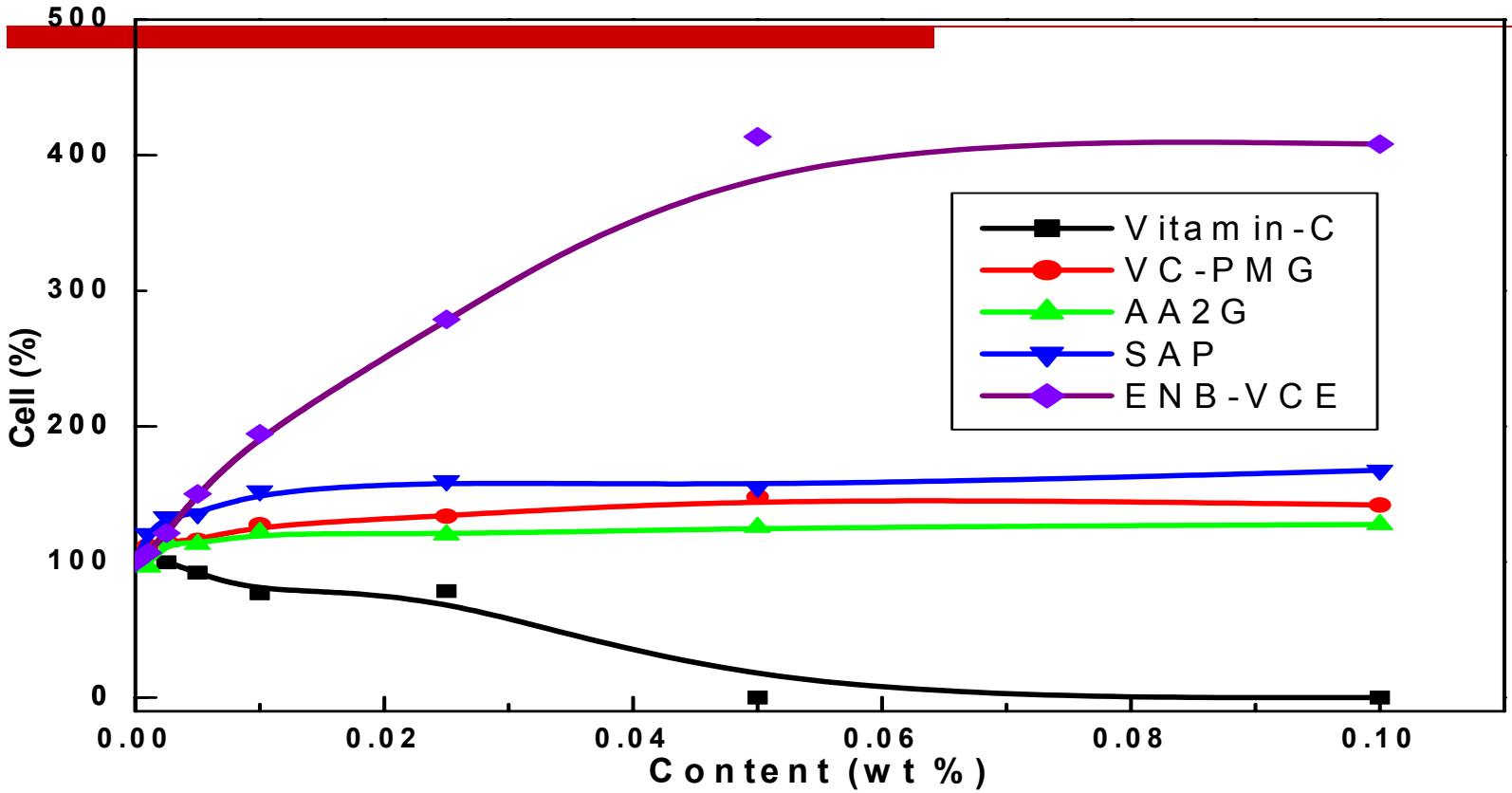


Fig. 5 Cell Toxicity Test by 10% FBS Environment

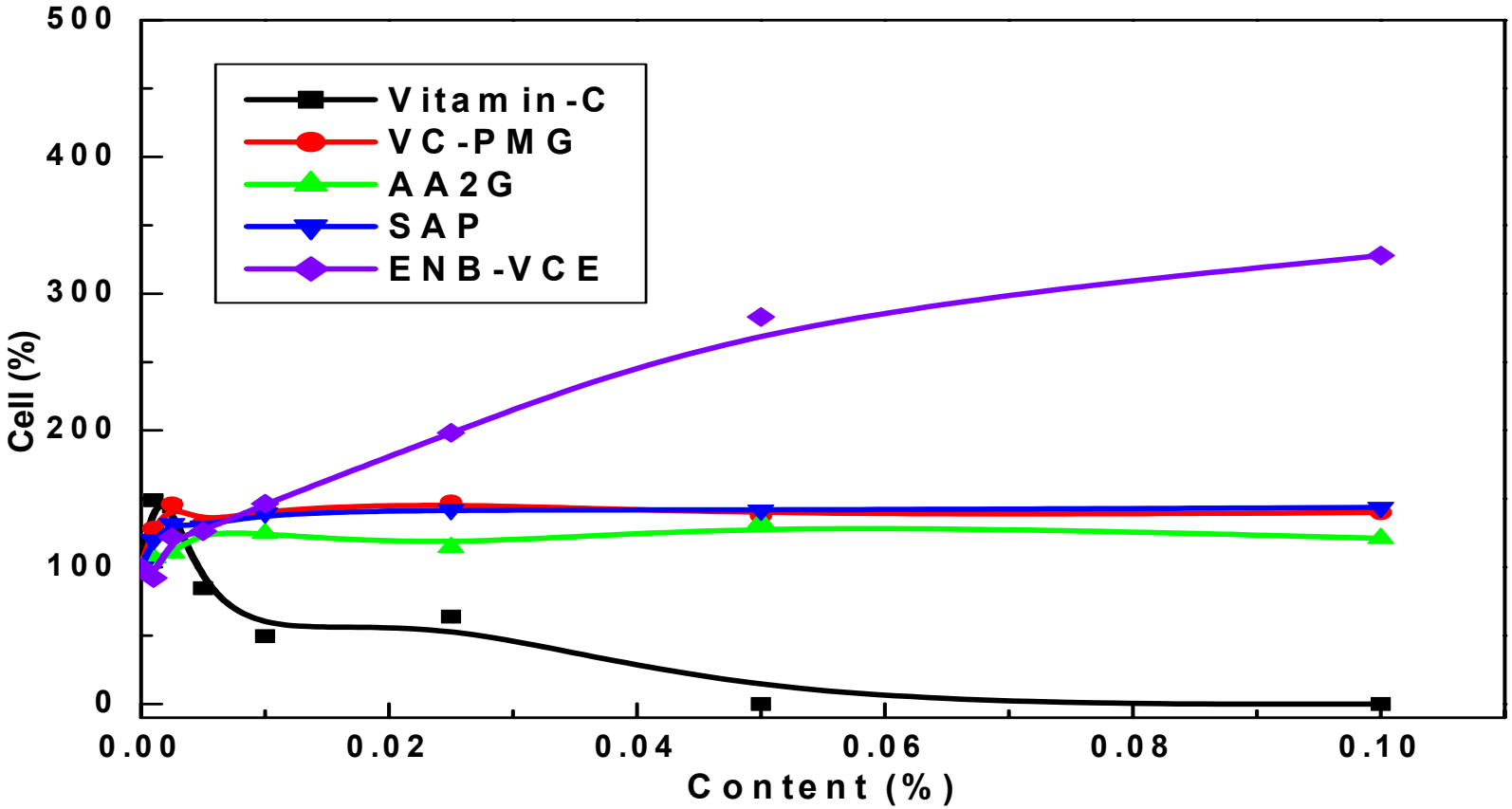


Fig. 6 Cell Toxicity Test by 4% FBS Environment)

2-6. Delivery of Vitamin C to skin

- Low Molecular Weight
- Good Water solubility (L-ascorbic acid)
  - Ether bonding

Table 1. Comparison by Vitamin-C Derivative

Item	Formula	M/W	V-C Contents
VC-PMG	$C_6H_8O_9P3/2Mg$	303.5	62.0
AA2G	$C_{12}H_{18}O_{11}$	362	51.9
SAP	$C_6H_6O_9P3Na$	334	56.3
ENB-VCE	$C_8H_{12}O_6$	204.2	86.3

IV. STABILITY

1. STABILITY by pH

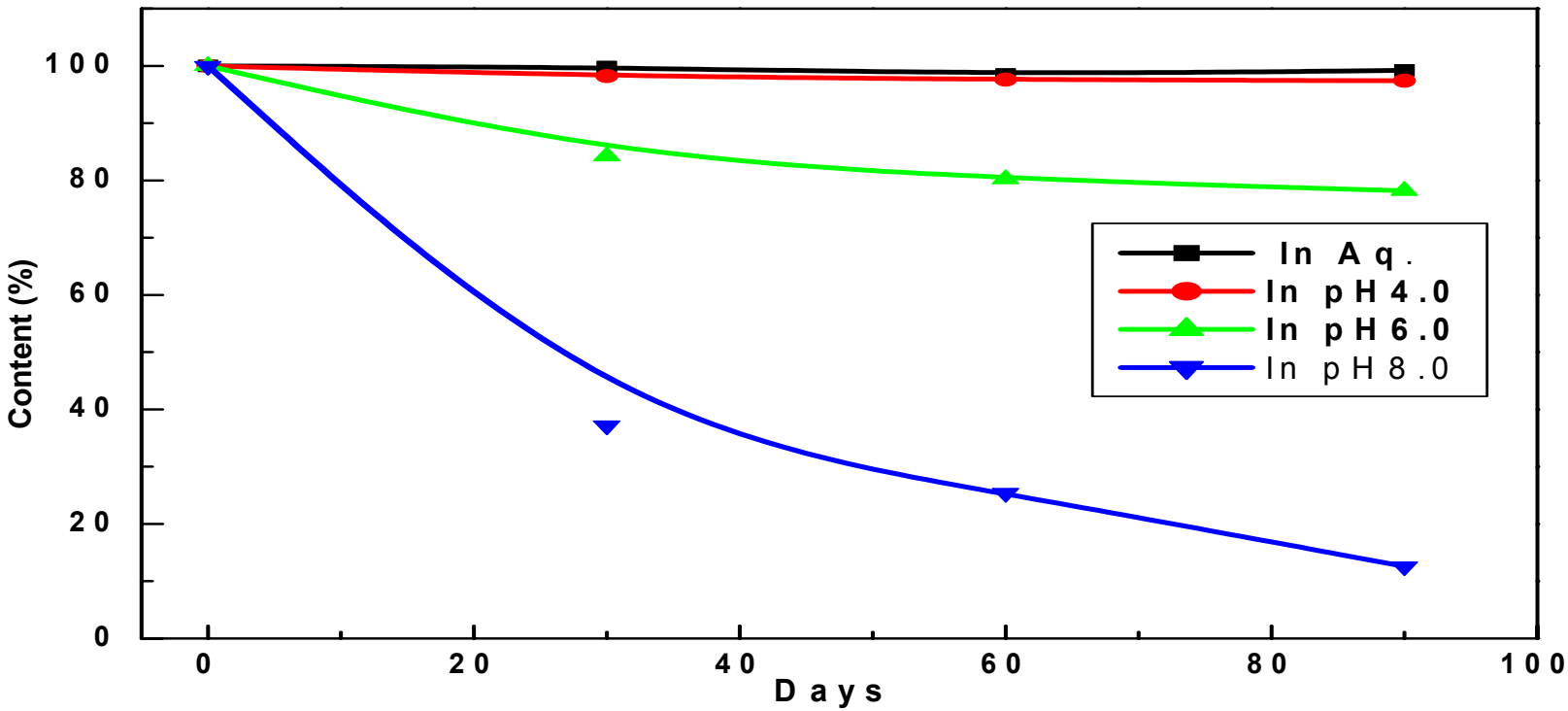


Fig. 7 Stability by Buffer solution (40℃ for 90 days)

IV. STABILITY

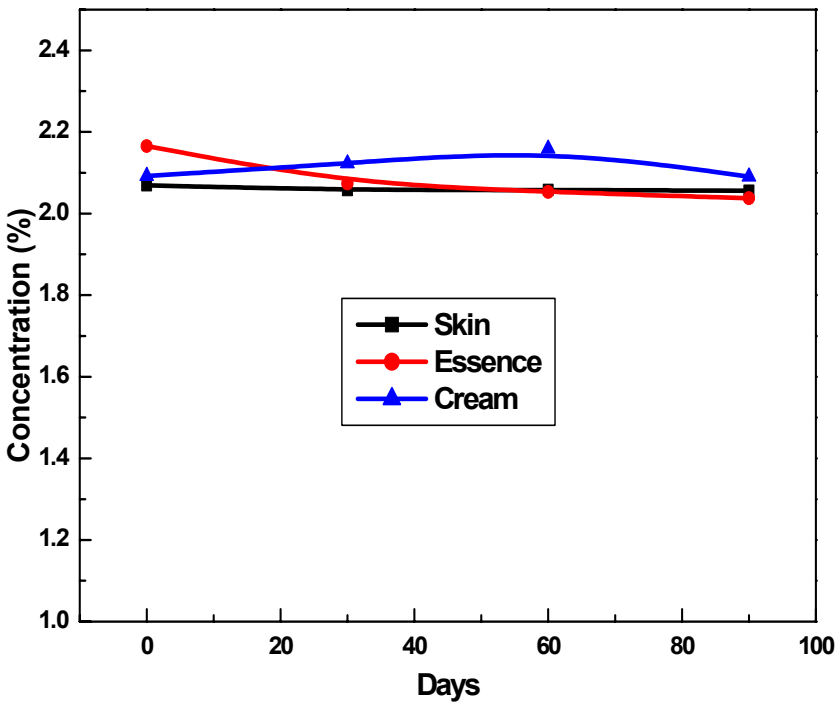
2. Stability in formulation

Table 2. Test Condition

Storage environment :	Skin, Essence in Incubator (40℃), Cream to room temperature
Analysis environment :	Column (X-Terra15cm), Eluant (Buffer), Flow rate (0.8mL/min), Detector (UV 245nm), Temperature(20℃), Pressure(1,650-1,750 psi)
Period of Analysis :	90 days (per 1 month)
Test Item :	Skin, Essence, Cream
Analysis samples :	2 types per 1 item and 3 samples of each type

IV. STABILITY

(a) TYPE-I



(a) TYPE-II

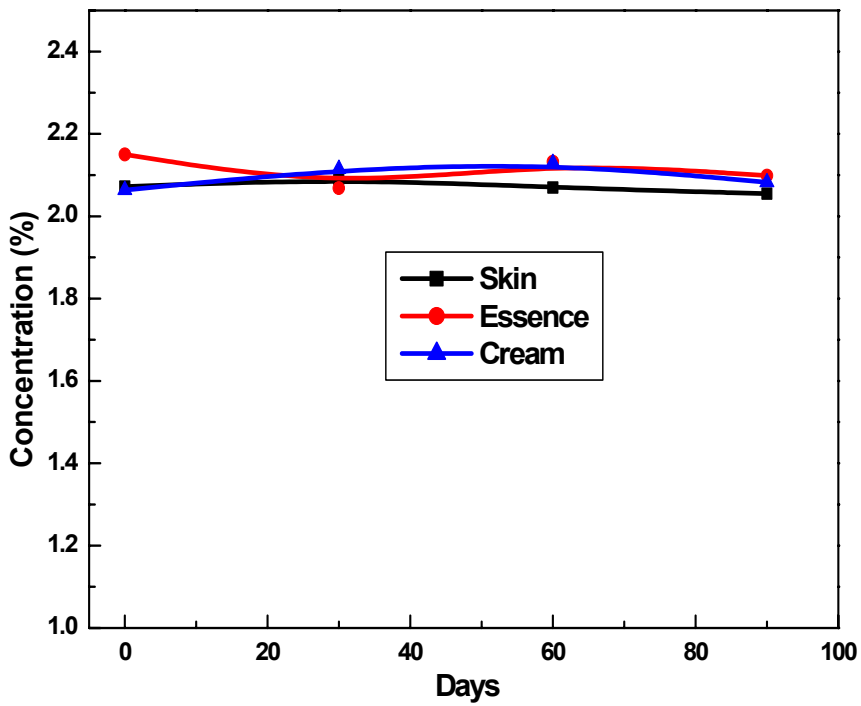


Fig. 8 Change of ENB-VCE as Time goes on

V. Comparing ENB-VCE with J

1. Appearance

Fig. 9 Photograph of Comparing ENB-VCE with J

V. Comparing ENB-VCE with J

2. IR Data

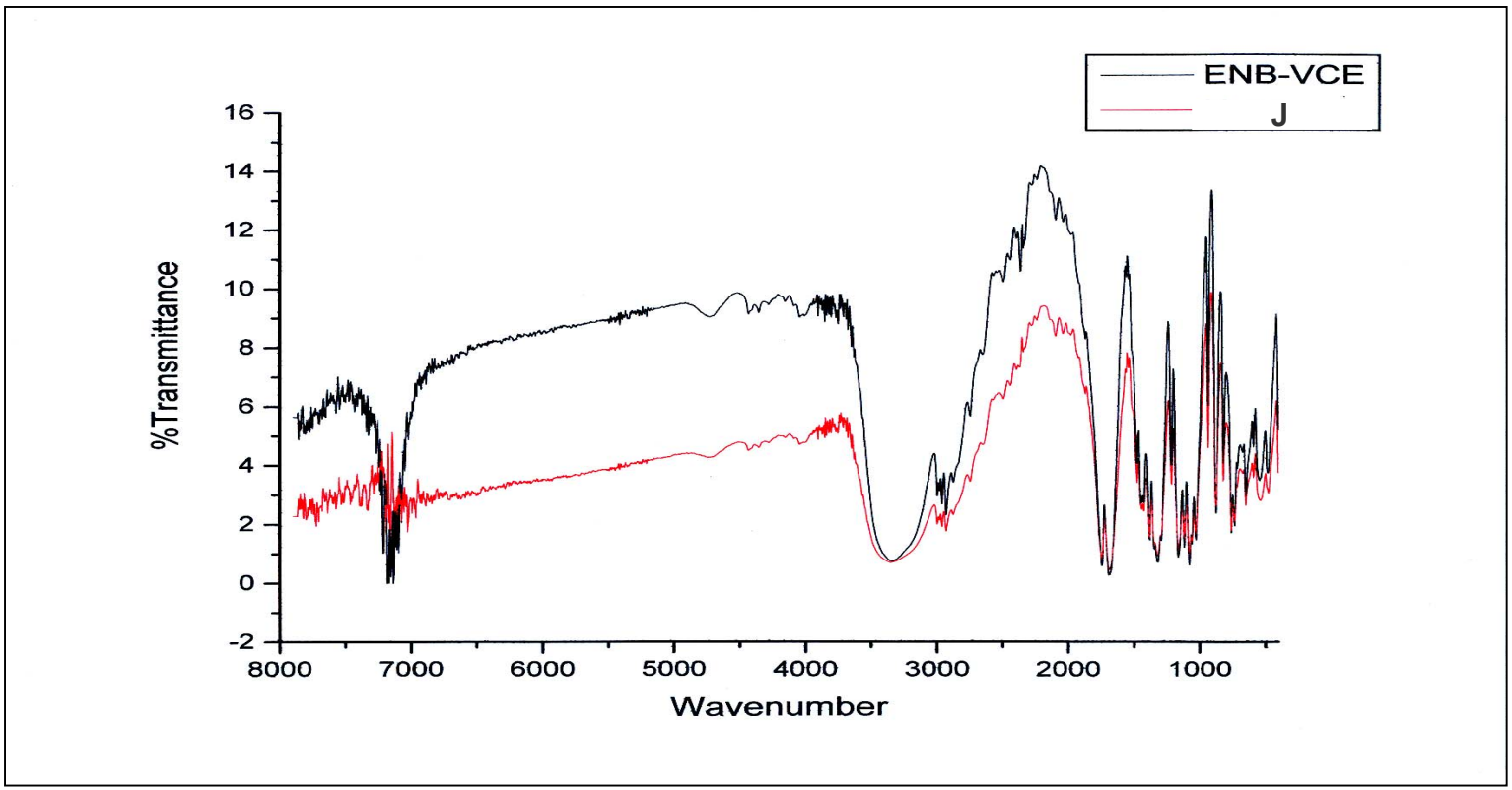
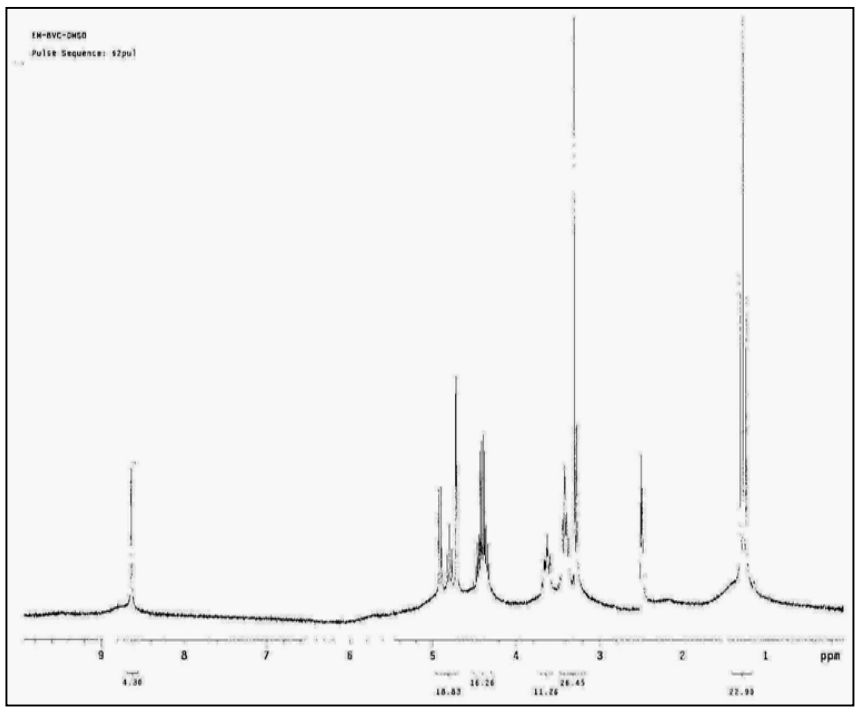


Fig. 10 IR-Graph of Comparing ENB-VCE with J

V. Comparing ENB-VCE with J

3. NMR Data

(a) ENB-VCE



(b) J

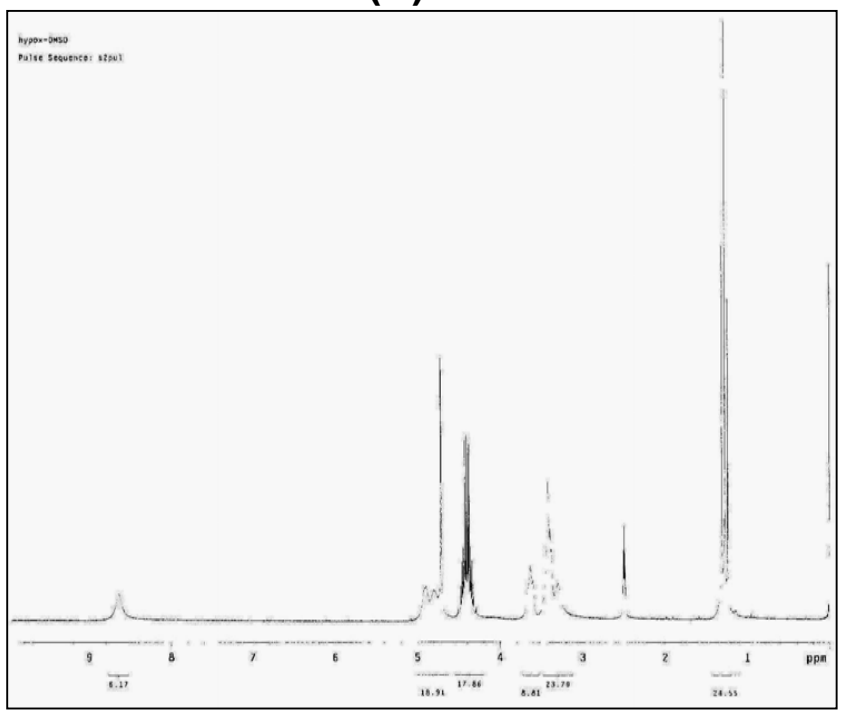
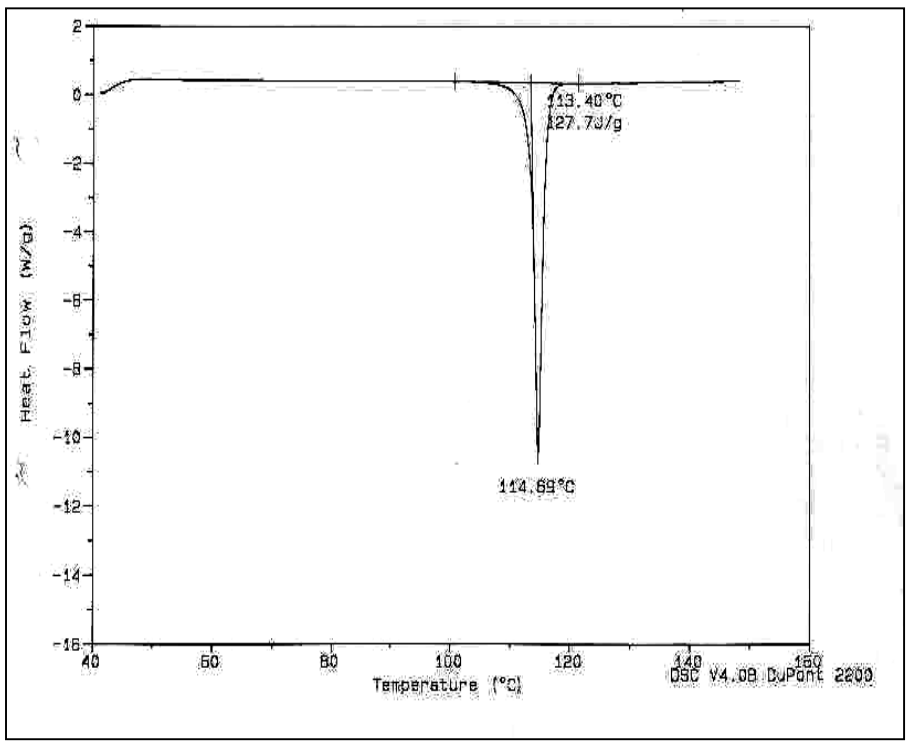


Fig.12 NMR-Graph of Comparing ENB-VCE with J

V. Comparing ENB-VCE with J

4. DSC Data

(a) ENB-VCE



(b) J

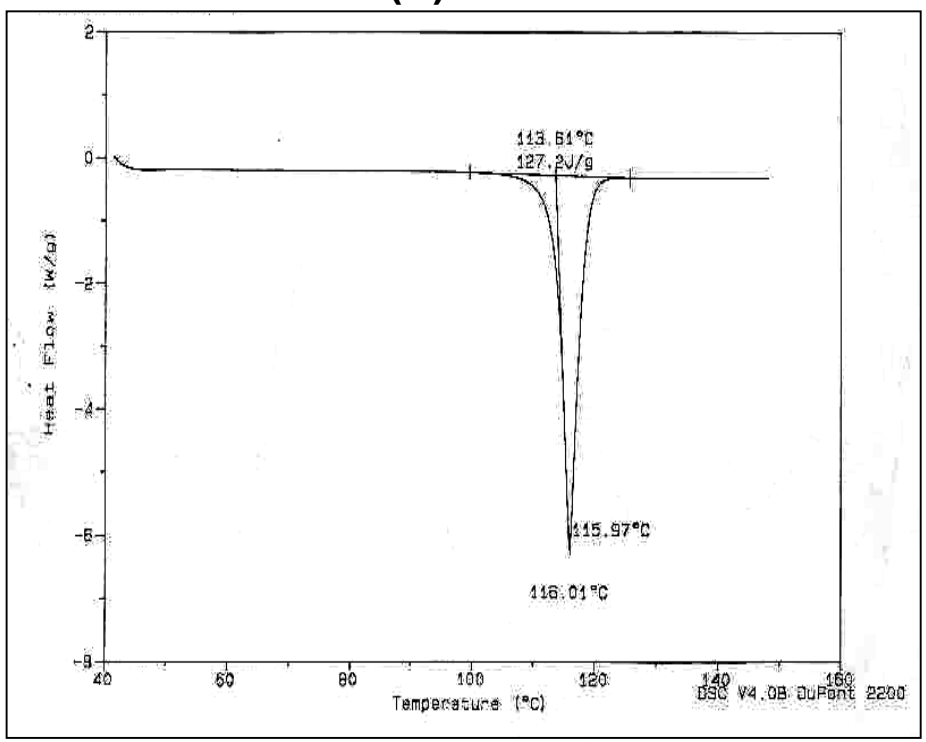
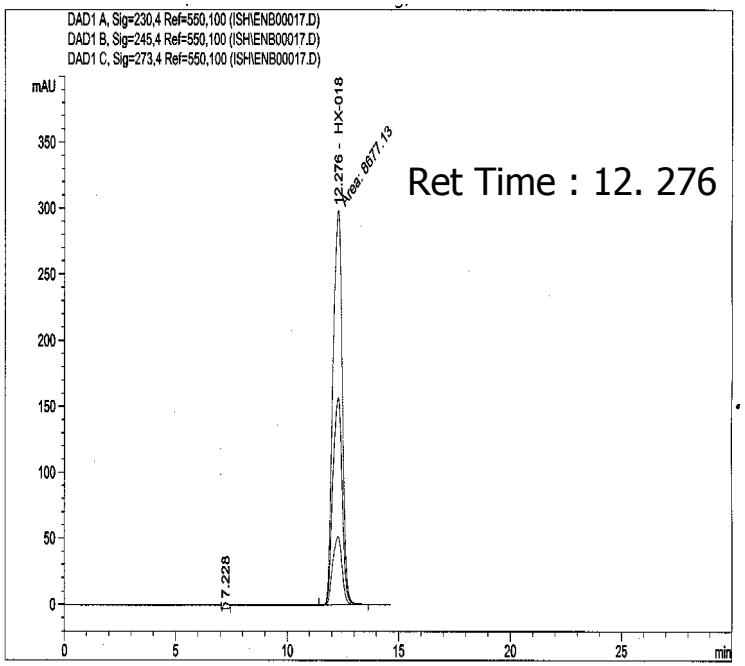


Fig.11 DSC-Graph of Comparing ENB-VCE with J

V. Comparing ENB-VCE with J

5. HPLC Data

(a) ENB-VCE



(b) J

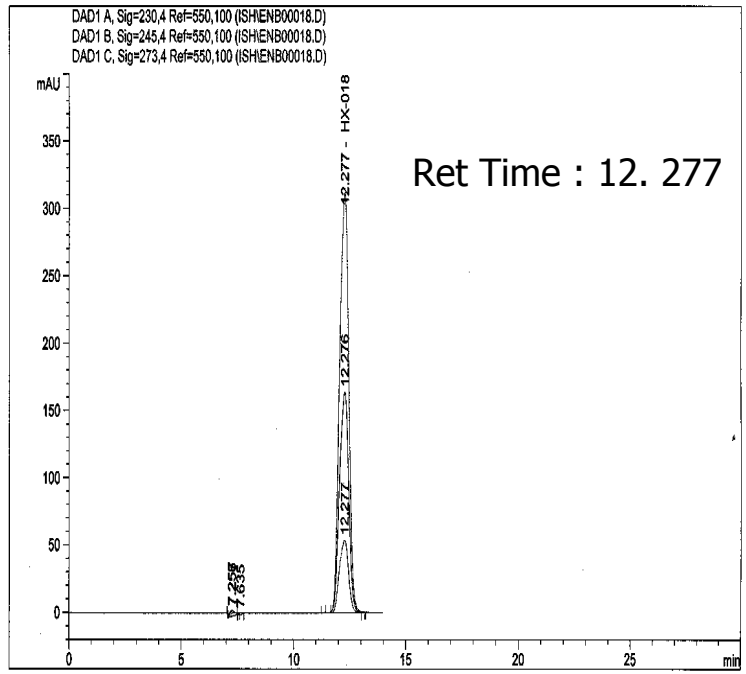
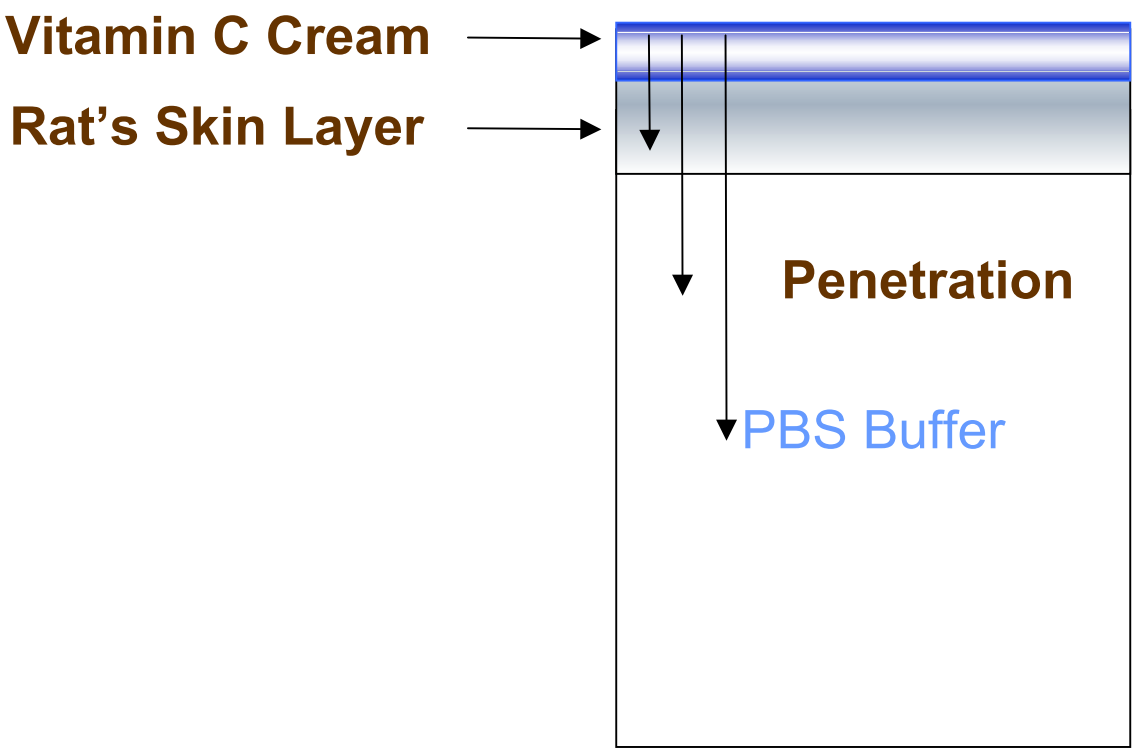


Fig.12 HPLC-Graph of Comparing ENB-VCE with J

VI. Skin Penetration

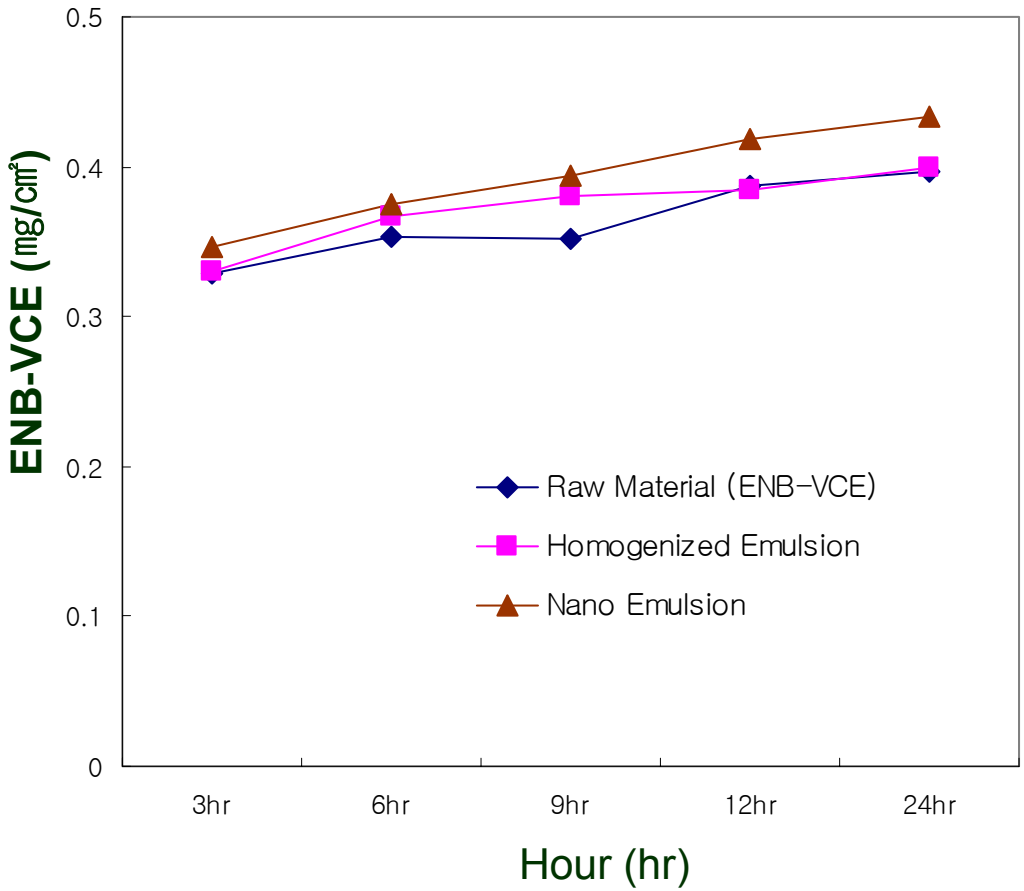
6-1. Delivery Reaction of ENB-VCE into Skin

Test Method



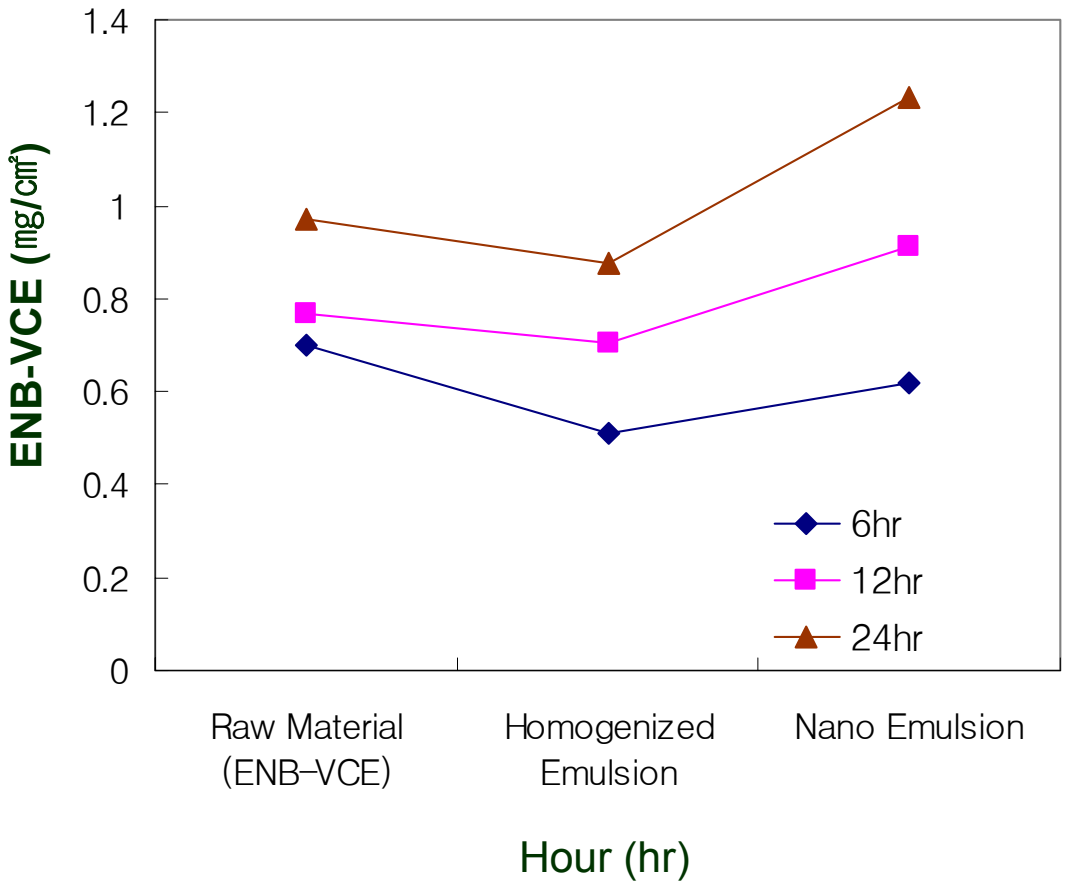
VI. Skin Penetration

6-2. Comparision the contained quantity of Nano emulsion absorbed PBS Bufffer



VI. Skin Penetration

6-3. Comparision the contained quantity of emulsion measured in Rat's Skin layer



マッサージ

マッサージクリーム（医薬部外品）

特長

「明るく白く輝いた肌へ」導く薬用美白マッサージクリーム。
マッサージの効果とともに、メラニンの生成をおさえてシミ・ソバカスを防ぎます。

成分

アルブチン（美白有効成分）　ビタミンCエチル（中味抗酸化成分）
和漢植物エキス　ビタミンE誘導体

使用法

○化粧水のあと肌を整えてからお使いください。
○手のひらに適量をとり、ゆっくりらせんを描くようにマッサージします。そのあとティッシュでやさしくふきとります。

化粧水

リファイニングソフナー（医薬部外品）

特長

さっぱりとした感触で、メラニンも含む不要な角質を取り除き、キメを整えます。明るく白く輝いた肌に導く、薬用美白化粧水。

成分

アルブチン（美白有効成分）　ビタミンCエチル（中味抗酸化成分）

和漢植物エキス　角質除去成分

使用法

○ 朝晩、洗顔のあとにご使用ください。コットンに500円硬貨大（約1.5ml）を含ませ、顔全体をやさしくふき取るようになじませます。