



1.

가 가 , 20
 , 2000 1
 6,000
 1,000
 1
 2
 1960
 가
 3
 10



1981 ()
 1983 ()
 1992 ()
 2000



1994 ()
 1996 ()
 2000 ()
 2000



1982 ()
 1988 ()
 1998 ()
 2000 /

Application of Polymers in the Field of High Functional Cosmetics

(Jin-Woong Kim, Ih-Seop Chang, and Hak-Hee Kang, Amore Pacific R&D Center, 314-1, Bora-ri, Giheung-eup, Yongin-si, Gyeonggi-do 449-729, Korea)

1. (: , %)

	1992	2000	2005
	2050 (45.4)	2943 (48.0)	4043 (51.1)
	649 (14.4)	1004 (15.2)	1329 (15.7)
	600 (13.3)	650 (10.5)	650 (8.3)
	432 (9.6)	525 (8.6)	577 (7.4)
	252 (5.5)	268 (4.4)	276 (3.5)
	103 (2.3)	169 (2.8)	226 (2.9)
	151 (3.3)	182 (3.0)	210 (2.7)
	130 (3.0)	177 (2.9)	200 (2.6)
	99 (2.2)	127 (2.1)	149 (1.9)
	45 (1.0)	86 (1.4)	140 (1.8)
	4511 (100)	6131 (100)	7800 (100)

2.

1950		가 ()
1960		()
1970		
1980	/	() 가
1990	/	

isolation, conjugation

smart carrier

2.

meceutical . Cosmeceu -
tical cosmetics pharmaceutical

cos -

A, C, E

, ceramide, **a** or **b** - hydroxy acid, glucan,
enzyme , cytokine modulator,

3.

	Cytokine
	Ceramide pseudoceramide Lamellar liquid crystal
	/
	Encapsulation 가
	DNA DNA shuffling, cell surface display, phage display

가
lipo -
some delivery system, microencapsulation, mi -
crosponge, nanocarrier³⁻⁵

3

가

3.

3.1

가

가

가⁶⁻⁸
collagenase elastase

, elastase , DNA , ATP

가 AHA
(alpha hydroxy acid)
(1).

3.1.1 AHA

AHA

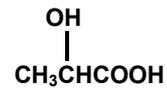
acid ceramide turnover
가 hyaluronic

, AHA

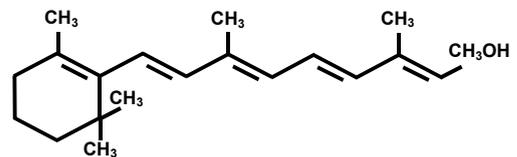
가

cyclodextrin AHA

, AHA



AHA (Lactic acid)



Vitamin A (Retinol)

1. AHA(α - hydroxy acid, lactic acid)
A

ester

3.1.2

가
가
가
A
9-12

turnover

가
가
biocon -

vertible precursor

6

13-15

LASS(liquid - crystal association stabilization system)

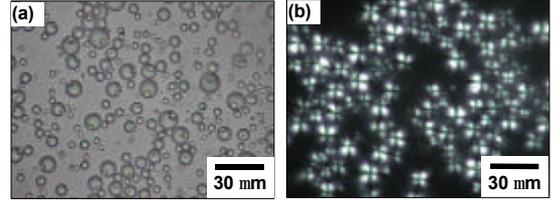
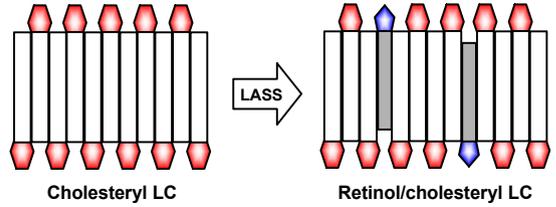
2 LASS

3

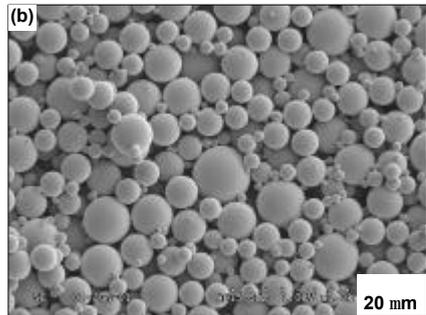
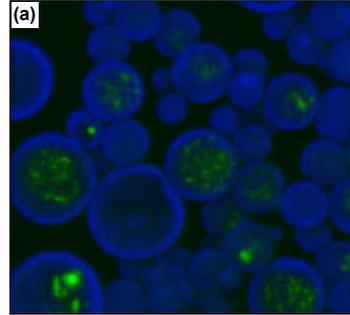
CLSM

SEM

LASS



2. /
(optical microscope, a)
(polarized optical microscope, b)



3. /
(confocal laser scanning microscope, a)
(scanning electron microscope, b)

3.2

1990

melanocyte

melanin

arbutin, kojic acid,

4.

Depigmentation materials	Mechanism	Remarks
SOD Glutathione	Scavenges free radicals	Obscure effect, not stable
Glucosamine, Galatosamine Manosamine, Tunicamycin	Inhibits tyrosinase synthesis	Obscure effect
Kojic acid	Interrupts intermediates in melanin biosynthesis	Slight irritation and allergy reaction, not stable
Hydroquinone	Cytotoxic effect on melanocyte	High toxicity to skin
Tocopherol Vitamin C derivatives	Reduce melanin formation	Obscure effect, not stable
Azelaic acid	Stimulates melanin elimination through the keratinocytes	Obscure effect
AHA Vitamin A	Enhance cell regeneration Exfoliate the skin	Obscure effect, skin irritation
Licorice extract	Tyrosinase inhibition Scavenges free radicals	Obscure effect
Arbutin	Inhibits tyrosinase activity	Obscure effect

C
tyrosine tyrosinase DOPA,
DOPA - quinone melanin
, melanin keratinocyte
melanin melanin

, tyrosinase

4

가

C

C

4

16

C

가

C

17 - 20

pH,

가

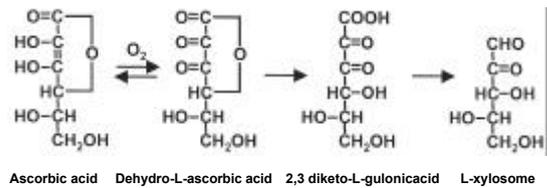
21,22

5

PMMA

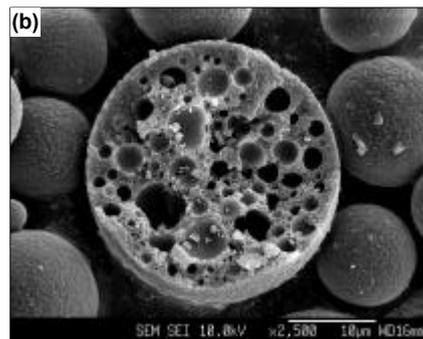
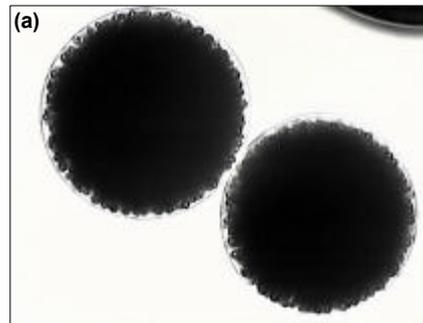
SEM

가



4.

C (ascorbic acid)



5.

(optical microscope, a)
(scanning electron microscope, b)

3.3

가

3.3.1

(whitening effect)

가

^{23,24}

6 TiO₂/PMMA

30%

secondary aggregate

7

3.3.2

UVA UVB

UVA

, UVA

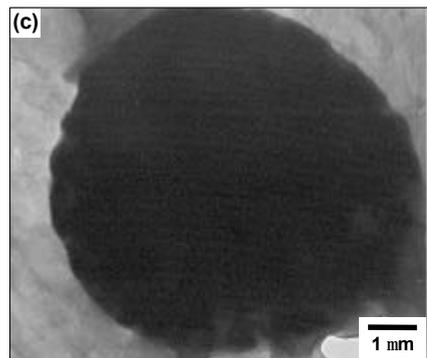
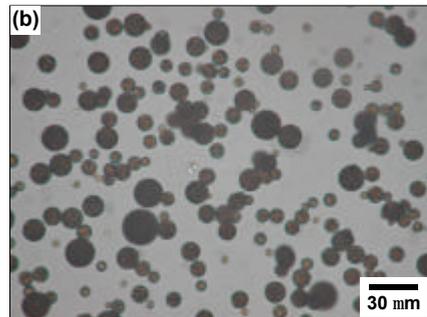
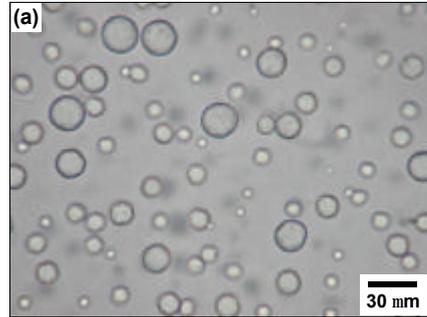
가

stil -

ben

UVA

, benzotriazol substituted



6. / (SCADDERTM)

(a) PMMA, poly(methyl methacrylate), (b) TiO₂/PMMA, (c) TiO₂/PMMA (transmission electron microscope)

microscope)

polyorganosiloxane

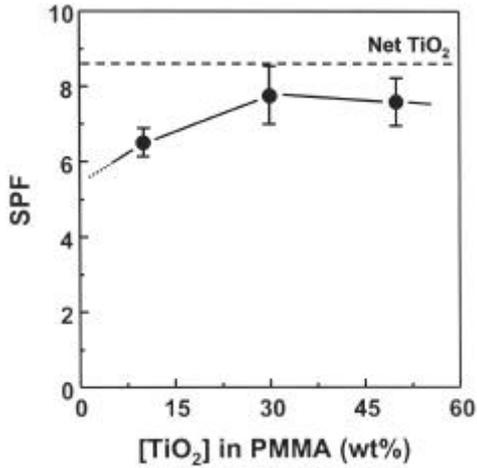
가

3.4

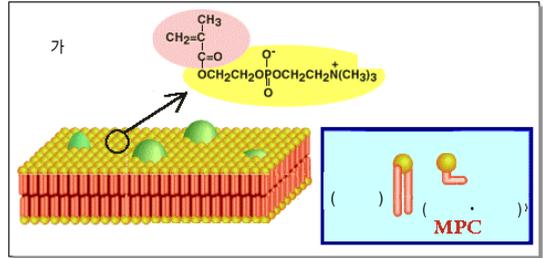
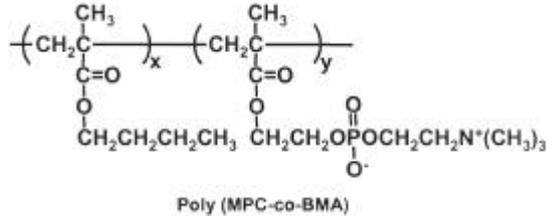
가

가

가



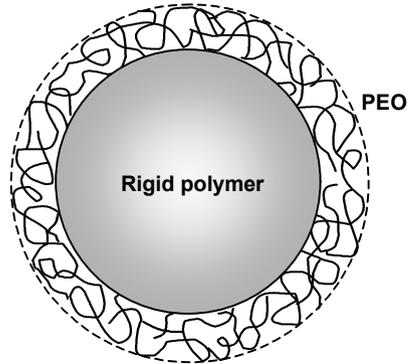
7. / (SCADDER™)
(SPF, sun protection factor).



8. (LIPIDURE)

가 sodium hyarunonate
chitin

(phospholipid)
25,26 1970



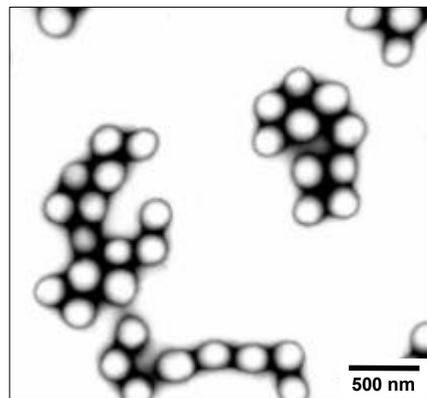
NANOQUASOME™
(100~200nm)

2 - methacryloyloxyethyl phos -
phorylcholin (MPC) 27

8

가 TEM

9



9. (NANOQUASOME™)

3.5

3.5.1

가

, PMMA, 가

3.5.2

28,29

가 30-32

3.5.3

가

가

가 10

1000 nm

가

33

DNA

34-37

poly(D,L - lactide), poly (lactic acid) (PLA), poly(D,L - glycolide) (PLG), poly(lactide - co - glycolide) (PLGA) poly(cya - noacrylate) (PCA)

, sodium algi - nate /

가

4.

가

“FUSION”

가

가

가

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