

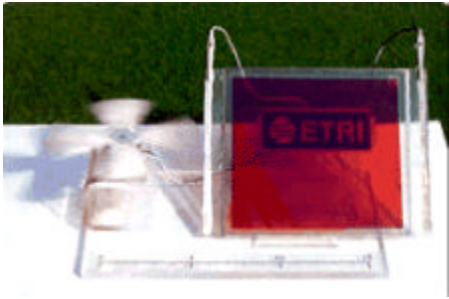
[R&D]

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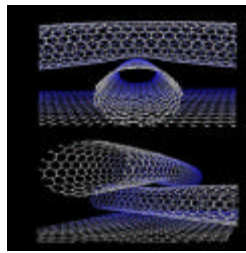
1.

(Nanotechnology)
 1950 가
 MIT 가 .
 가 . 가 .
 10 1
 nanos-
 () , 1 가 .
 1 1(10 1m) .
 가 .
 가
 (Nanotechnology, NT)
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 가 : . ,
 , 1 100 (: : ,
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 , 가 : ,
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- : , ,
- 가 : , ,



1 가 20% 가)



2

(NT) , NNI(Nat'l Nanotech. Initiative) , (NSF, , NIH) 2001 (270 495) . . 가

2000 , 320 .

2000 50 .

1 가

			2001 ()
	가	' , ' , .	497
	()	가	33
	()	'	50
	TOP NAND 21 ()	' , ' , ' 1	100

2

(CRI), (CT-21), 가 (NRL)

Nanotechnology

2010

2000

21 가 3

(IT), (BT),

(2000.7 10)

”(KIST , 20)

2010

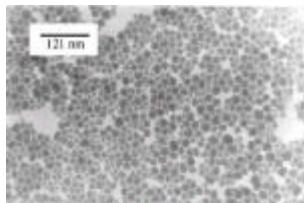
154

2. , , , 10 가가 (nanoemul- sion), (polymeric nanoparticles), (solid lipid nanoparticles) . 가 가

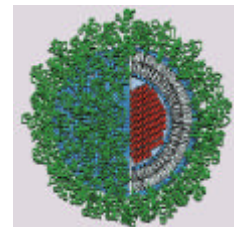
Brown , , , , 가 van der Waals 가 . , , HLB , (Inversion (Nanoparticle) 10 200nm (carrier) Emulsification), (PIT), D 가



Multiple nanoemulsion SEM image(freeze fracture method)



Polymer nanoparticle TEM image



Alzas Stealth liposome

(High Shear, High Pressure)

Microfluidizer APV

Microfluidizer(MF)

2

200nm 가 가	micro-size
가	Non-greasy long-lasting
	Blue emulsion
가	
	long-lasting
Particle size	
가 SPF	SPF
가 가	가 가

smart materials

가

()

가

가 1)

가

가

가

가

/

lecithin/hydrogenated lecithin

■ *Self-emulsifying lyophilized emulsion/liposome*
 Oil lecithin glycerol, propylene glycol,
 sorbitol 가 가
 emulsion
 polyol
 emulsion , 30%
 glycerol
 , Soybean oil 가 emulsion

가 가
 (PDA J. Pharm. Sci. Technol., 1999, 53(4) 168-76 ; 53(6) 318-23)

■ *Liposome - emulsion transition by oil content*
 Tocopheryl acetate, coenzyme Q10, retinyl
 palmitate, retinol, sesame oil
 liposome nanoemulsion ,
 liposome nanoemulsion
 . (Langmuir, 1999, 15(22),
 7454-7460 ; Drug. Dev. Ind. Pharm., 2000, 26(1)
 85-90 ; Pharm. Dev. Technol. 2000, 5(1) 39-45 ;
 Chem. Phys. Lipids. 1999, 99(1) 87-93 ; J.
 Microencapsul. 1999, 16(6) 705-13)

■ *Effect of additives/coemulsifier on the size
 and stability of emulsion/liposome*
 Lecithin 가
 가 가 Span
 20 가 , Soybean oil MCT

lecithin stearylamine dicetylphosphate
 가 stearylamine
 emulsion 가
 stearylamine lecithin
 . Sorbitol glycerol
 (PC) lecithin
 emulsion glycerol
 . (PDA J. Pharm. Sci.
 Technol 1998, 52(6) 331-6 ; J. Pharm. Belg. 1998,
 53(2) 81-6)

■ *Lecithin containing microemulsion*
 Indomethacin water, IPM, lecithin,
 lysolecithin. alcohol microemulsion
 Flurbiprofen ethyl oleate, lecithin,
 distearoylphosphatidyl-ethanolamine-N-poly(eth
 yleneglycol)2000 microemulsion
 . (J. Controlled
 Release 1999, 60(2-3) 399-405 ; Int. J. Pharm.
 1989, 183(2) 145-154)

■ *Enhancing skin permeation*
 Lecithin aggregates ketoprofen
 . Stearylamine,
 deoxycholic acid /
 nanoemulsion
 . Phosphatidylcholine sodium
 cholate, span 80, oleic acid
 liposome/ solution oestradiol
 . Ethosomes (lecithin + EtOH)
 minoxidil
 . (J. Controlled Release 2000, 63(1-2) 165-73
 ; J. Controlled Release 1999, 58(2) 177-87 ; Int. J.

Pharm. 2000, 204(1-2) 159-69 ; J. Controlled Release 2000, 65(3) 403-18)

2) Nanodispersion

wax

sol-gel process

■ *Polymeric nanoparticle preparation by solvent extraction*

oil, drug, polymer

가 가

nanocapsule

. Poly(caprolactone) indium
oxine nanocapsule nanocapsule .
(Pharm. Res. 1998 15(7) 1056-62 ; J. Biomed.
Mater. Res. 1998 39(4) 588-93)

■ *Emulsion/interfacial polymerization*

Poly(isobutylcyanoacrylate) interfacial poly-
merization insulin capsulation
insulin 가
(Int. J. Pharm. 1999
183(1) 63-6 ; J. Biomed. Mater. Res 1999, 47(4)
568-76)

■ *Solid lipid nanoparticle*

(tetracaine, etomidate)

, , ,

. SLN

1가, 2가, 3가

가 , 가

aggregation gelling . (J.

Microencapsul. 1999, 16(2) 205-13 ; J. Microen-
capsul. 1999, 16(1) 59-71)

■ *Polymer-stabilized metal/metal oxide nanoparticle*

PtCl₆ poly(N-vinylisobutyramide)(PNVIBA)

0.8 EtOH

10-30 A PNVIBA-Pt

,
. In-situ Ag, Au, Pd

Poly(2-hydroxyalkylmethacrylates)

. (Colloids & Surface A -
Physicochemical & Engineering Aspects, 2000,
169(1-3) 107-116 ; Polymer 2000, 41(4) 1627-
1631)

■ *Microemulsion mediated sol-gel synthesis*

Sodium bis(2-ethylhexyl) sulfosuccinate/
decane/ammonium hydroxide

reverse microemulsion

tetraethoxysilane silica

. Reverse microemulsion

sol-gel bariumhexaaluminate

. 2가

alkoxide microemulsion

sol-gel MAI₂O₄ (M=Co, Ni, Cu)

aluminate . Zn

15-100 A ZnO

. (J. Colloid & Interface Sci. 1995, 170(1) ; Nature

2000, 403(6765) 65-67 ; J. Material Chem. 1999,
9(8) 1755- 1763 ; Chem. Materials 1998, 10(4))

3.

220 8%
(Cosmeceutical Trends & Technologies,
2nd Ed., TCI, 1997).

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320 , 3 4
(, ,
1997).

가
가 ,
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