LAMPIRAN

Lampiran 1 Certificate of Analysis Adapalen

AARTI INDUSTRIES LIMITED
Factory : Unit - IV, Plot No. E-50, MIDC, Tarapur,
Taluka & District- Palghar, Pin - 401506. Maharashtra, INDIA.
Tel.: +91 8983035452, 8983065452, Telefax : (02525) 661092

CERTIFICATE OF ANALYSIS
ADAPALENE BP

Batch No.	: AD-18202(JM-01)-001RP	**Date of Mfg.**	: JUN-2018
AR. No.	: FG/0484/18	**Date of Exp.**	: MAY-2023
Batch Qty.	: 22.27 Kg	**Date of Release**	: 22/08/18

Sr. #	TESTS	RESULTS	SPECIFICATION
1.	Description	Almost white powder	White or almost white powder.
2.	Solubility	Complies	Sparingly soluble in Tetrahydrofuran, Practically insoluble in water and ethanol (96%)
3.	Identification A)By IR	Complies	The Infra Red spectrum of Sample should concordant with similar preperation of that of Adapalene WS.
	B)By HPLC	Complies	The retention time of the major peak of the sample solution corresponds to that of standard solution, as obtained in the assay
4.	Appearance of Solution	Complies	The solution is clear and not more intensely coloured than reference solution BY_6
5.	Related substances (By HPLC)	Below disregard limit	Impurity A : Not more than 0.3%
		Below disregard limit	Impurity C : Not more than 0.15%
		Below disregard limit	Impurity D : Not more than 0.2%
		Below disregard limit	Unspecified impurities : Not more than 0.10%
		Below disregard limit	Total impurities : Not more than 0.5%
6.	Heavy metals	Complies	Not more than 20 ppm
7.	Loss on drying (At 105°C for 4 hours)	0.19 %	Not more than 0.5 %
8.	Sulphated ash	0.04%	Not more than 0.1 %
9.	Assay (By HPLC)	100.27 %	Between 98.0 % to 102.0 % on dried substances
10.	Residual solvents (By HSGC)	Not detected	Dichloromethane : NMT 600 ppm
		27 ppm	Ethyl acetate : NMT 5000 ppm
		113 ppm	Tetrahydrofuran : NMT 720 ppm
		640 ppm	Toluene : NMT 890 ppm
		Not detected	Diglyme : NMT 500 ppm
11.	Triethylamine content (By HSGC)	10 ppm	Not more than 80 ppm

Remark: The material complies as per BP and above specification.

Analyst	Checked By	Approved By
For 22/08/18	22/08/18	22/08/18
Vikas Pardeshi Analyst	Mahendra Girase Head Quality Control	Shyamsundar Desai Head Quality Assurance

AARTI INDUSTRIES LTD.
Unit - IV, Plot No. E-50,
MIDC, Tarapur, Tal. & Dist. Palghar,
Pin - 401 506. Maharashtra. India.

HEAD OFFICE :
71, Udyog Kshetra, 2nd Floor, Mulund Goregaon Link Road, Mulund (W), Mumbai - 400 080. INDIA
Tel. : 00 - 91 - 22 - 67976666, 67976697, 25918195 • Fax : 00 - 91 - 22 - 25904806, 25653185 / 3234
Regd. Office : Plot No. 801/23, G.I.D.C. Estate, Phase - III, Vapi-396195, Dist- Valsad, Gujarat, INDIA.

Lampiran 2 *Certificate of Analysis* Precirol® ATO5

GATTEFOSSÉ

Certificate of Analysis

Product name : PRECIROL ATO 5

Item N° : 3092PPD
Batch N° : 189604
Manufacturing date : 05.2018
Expiry date : 05.2020

CHEMICAL DEFINITION :
Glycerol distearate (type I EP / Glyceryl distearate NF.

Characteristic	Method	Specification	Result
MANUFACTURING PLANT		Gattefossé : 01 / Innovia : 06	01.01
APPEARANCE	MA0193	Fine white powder	Conforms
ODOUR	MA0170	Faint	Conforms
COLOUR (Gardner Scale)	MA0214	<= 3.0	0.9
DROP POINT (METTLER)	MA0003	53.0 to 60.0°C	58.3
ACID VALUE	MA0008	<= 5.00 mgKOH/g	1.76
SAPONIFICATION VALUE	MA0172	165 to 195 mgKOH/g	167
IODINE VALUE	MA0092	<= 3.0 g/2/100g	<= 3.0*
FREE GLYCEROL CONTENT	MA0006	<= 1.0 %	0.2
TOTAL MONOGLYCERIDES CONTENT	MA0006	8.0 to 22.0 %	17.4
TOTAL DIESTERS CONTENT	MA0006	40.0 to 60.0 %	50.7
TOTAL TRIESTERS CONTENT	MA0006	25.0 to 35.0 %	30.8
PALMITIC ACID (C16)	MA0002	40.0 to 60.0 %	44.5
STEARIC ACID (C18)	MA0002	40.0 to 60.0 %	53.2
SUM OF PALMITIC AND STEARIC ACIDS	MA0002	>= 90.0 %	97.7
WATER CONTENT	MA0007	<= 1.0 %	< 0.1
TOTAL ASHES CONTENT	MA0026	<= 0.1 %	<= 0.1*
NICKEL CONTENT	MA0256	< 1 ppm	Conforms
HEAVY METALS CONTENT (Pb)	MA0032	< 10 ppm	Conforms *

* Characteristic guaranteed but not tested.

This batch was released by our authorized Quality Manager and was found to meet the specifications as stated above. The above results do not discharge the customer from the obligation to carry out an inspection of goods received.
This report has been produced electronically and does not require a signature.

Printing Date : 11.12.2018

Quality Manager
Magali DRONNIER

GATTEFOSSÉ SAS - 36 chemin de Genas - CS 70070 - 69804 SAINT-PRIEST Cedex - France - Tél. : +33 4 72 22 98 00 - Télécopie : +33 4 78 90 46 07
S.A.S. au capital de 8 850 000 Euros - R.C.S. Lyon B 389 558 900 - N° d'identité CEE FR 43 389 558 900

Lampiran 3 Karakter SLN Adapalen

Formula	Ukuran Partikel (nm)	Indeks Polidispersitas	Zeta Potensial (mV)
PAC 2%	130,77 ±18,65	0,27 ± 0,04	-23,2 ± 0,3
PAC 3%	115,57 ± 2,80	0,23 ± 0,03	-19,57 ± 0,93
PAC 4%	160 ± 2,09	0,24 ± 0,03	-17,7 ± 0,44
PAC 5%	186,07 ± 1,10	0,26 ± 0,002	-18,97 ± 0,15
PAC 6%	200,67 ± 3,33	0,25 ± 0,01	-18,4 ± 0,36

Lampiran 4 Kurva Kalibrasi Adapalen

3.1 Perhitungan Pembuatan Larutan Adapalen

3.1.1 Larutan Induk

Konsentrasi Larutan $= \frac{\text{Bobot Adapalen}}{\text{volume}}$

100 ppm $= \frac{\text{Bobot Adapalen}}{100\ \text{mL}}$

= 100 ppm x 100 mL

Bobot Adapalen = 10.000 µg = 10 mg

3.1.2 Pengenceran Larutan

a. Konsentrasi 1 ppm

$V_1 \times C_1 = V_2 \times C_2$

V_1 x 100 ppm = 10 mL x 1 ppm

$V_1 = \frac{10\ \text{mL} \times 1\ \text{ppm}}{100\ \text{ppm}}$

V_1 = 0,1 mL = 100 µL

b. Konsentrasi 2 ppm

$V_1 \times C_1 = V_2 \times C_2$

V_1 × 100 ppm = 10 mL × 2 ppm

$V_1 = \frac{10\ mL \times 2\ ppm}{100\ ppm}$

V_1= 0,2 mL = 200 µL

c. Konsentrasi 3 ppm

$V_1 \times C_1 = V_2 \times C_2$

V_1 × 100 ppm = 10 mL × 3 ppm

$V_1 = \frac{10\ mL \times 3\ ppm}{100\ ppm}$

V_1 = 0,3 mL = 300 µL

d. Konsentrasi 4 ppm

$V_1 \times C_1 = V_2 \times C_2$

V_1 × 100 ppm = 10 mL × 4 ppm

$V_1 = \frac{10\ mL \times 4\ ppm}{100\ ppm}$

V_1 = 0,4 mL = 400 µL

e. Konsentrasi 5 ppm

$V_1 \times C_1 = V_2 \times C_2$

$V_1 \times 100\ ppm = 10\ mL \times 5\ ppm$

$$V_1 = \frac{10\ mL \times 5\ ppm}{100\ ppm}$$

$V_1 = 0{,}5\ mL = 500\ \mu L$

f. Konsentrasi 6 ppm

$V_1 \times C_1 = V_2 \times C_2$

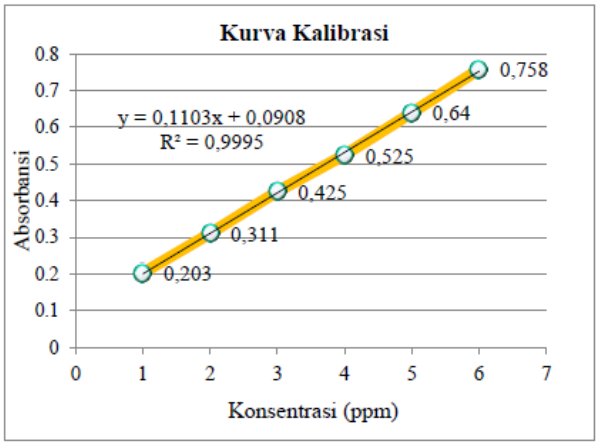
$V_1 \times 100\ ppm = 10\ mL \times 6\ ppm$

$$V_1 = \frac{10\ mL \times 6\ ppm}{100\ ppm}$$

$V_1 = 0{,}6\ mL = 600\ \mu L$

3.2 Kurva Kalibrasi Adapalen

Konsentrasi	Absorbansi
1 ppm	0,203
2 ppm	0,311
3 ppm	0,425
4 ppm	0,525
5 ppm	0,640
6 ppm	0,758



Lampiran 5 Perhitungan %EE SLN Adapalen

Konsentrasi Larutan

$$\text{Konsentrasi} = \frac{y - a}{b}$$

Bobot zat aktif bebas

$$\text{Bobot zat aktif bebas} = \text{Konsentrasi} \times \text{Volume} \times \text{fp}$$

Rumus EE%

$$\%\ \text{EE} = \frac{\text{total zat aktif} - \text{zat aktif bebas}}{\text{total zat aktif}} \times 100\%$$

Formula	Absorbansi	%EE
PAC 2%	0,5975	98,46822
PAC 3%	0,502	98,75733
PAC 4%	0,397	99,07464
PAC 5%	0,444	98,93261
PAC 6%	0,4493	98,91599

1. PAC 2 %

   Konsentrasi $= \frac{0,5975-0,098}{0,1103} = 4,53$ ppm

   Bobot zat aktif bebas = 4,53 ppm × 10 mL × 10 mL

   = 452, 86 µg = 0,45 mg

   % EE $= \frac{30\ mg-0,45\ mg}{30\ mg} \times 100\%$: 98,5%

2. PAC 3 %

   Konsentrasi $= \frac{0,502-0,098}{0,1103} = 3,66$ ppm

   Bobot zat aktif bebas = 3,66 ppm × 10 mL × 10 mL

   = 366 µg = 0,37 mg

   % EE $= \frac{30\ mg-0,37\ mg}{30\ mg} \times 100\%$: 98,7%

3. PAC 4 %

   Konsentrasi $= \frac{0,397-0,098}{0,1103} = 2,71$ ppm

   Bobot zat aktif bebas = 2,71 ppm × 10 mL × 10 mL

   = 271 µg = 0,27 mg

   % EE $= \frac{30\ mg-0,27\ mg}{30\ mg} \times 100\%$: 99,1%

4. PAC 5 %

   Konsentrasi = $\frac{0,444-0,098}{0,1103}$ = 3,14 ppm

   Bobot zat aktif bebas = 3,14 ppm × 10 mL × 10 mL

   = 314 µg = 0,31 mg

   % EE = $\frac{30\ mg-0,31\ mg}{30\ mg}$ x 100% : 98,9%

5. PAC 6 %

   Konsentrasi = $\frac{0,4493-0,098}{0,1103}$ = 3,18 ppm

   Bobot zat aktif bebas = 3,18 ppm × 10 mL × 10 mL

   = 318 µg = 0,32 mg

   % EE = $\frac{30\ mg-0,32\ mg}{30\ mg}$ x 100% : 98,9%

Lampiran 6 Pengukuran pH

Konsentrasi	Pengukuran 1	Pengukuran 2
PAC 2%	5,42 ± 0,023	5,86 ± 0,015
PAC 3%	5,46 ± 0,015	5,75 ± 0,036
PAC 4%	5,61 ± 0,050	5,75 ± 0,026
PAC 5%	5,29 ± 0,083	5,47 ± 0,012
PAC 6%	5,33 ± 0,067	5,42 ± 0,015

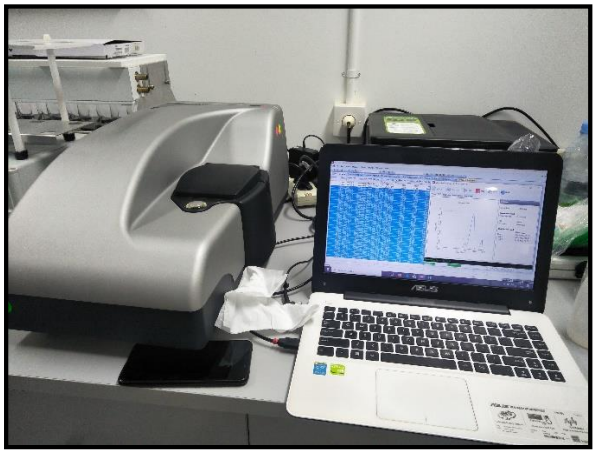
Lampiran 7 Dokumentasi Penelitian

Uji Daya Larut

Uji Solidifikasi

Sonikator *Probe*

Sentrifuga Pengukuran EE (2 siklus)



PSA & Zetasizer