

LAMPIRAN

Lampiran 1 Certificate of Analysis Vitamin E Asetat



DL-A-TOCOPHERYL ACETATE



CERTIFICATE OF ANALYSIS

Productcode : 0420085
 Lot No. : UT18080219
 Analysis No. : 03D07192

Test	Result	Limits / Specifications	Dimension / Units
Appearance visual	clear viscous oil	clear viscous oil	
Colour visual	colourless	colourless almost colourless slightly yellow slightly greenish yellow	
Identity GC	corresponds	corresponds	
Optical rotation Ph.Eur.	0.00	-0.01 to +0.01	*
Heavy metals ICP-MS	corresponds*	max. 10	ppm
Lead ICP-MS	corresponds*	max. 2	ppm
Arsenic ICP-MS	corresponds*	max. 1	ppm
Mercury ICP-MS	corresponds*	max. 0.1	ppm
Cadmium ICP-MS	corresponds*	max. 0.5	ppm
Residual Solvents - Pyridine GC	corresponds*	max. 200	ppm
- Toluene GC	corresponds*	max. 890	ppm
Acidity Titration / USP	0.1	max. 1.0	ml 0.10N NaOH
Related Subst. (Ph.Eur.) - Impurity A GC	0.1	max. 0.5	%
- Impurity B GC	0.6	max. 0.6	%
- Impurity C (free tocopherol) GC	0.1	max. 0.5	%
- Impurity D and E GC	0.3	max. 1.0	%
- Any other impurity, each GC	0.07	max. 0.25	%
- Total GC	1.6	max. 2.5	%

DSM Nutritional Products Ltd
 Branch Site Sisseln
 Quality Management
 CH-4334 Sisseln

1 / 2

Date of Issue : 31-Aug-2018

Lampiran 2 Kurva Kalibrasi Vitamin E Asetat

1.1 Perhitungan Pembuatan Larutan Vitamin E Asetat

1.1.1 Larutan Induk

$$\begin{aligned}\text{Konsentrasi Larutan} &= \frac{\text{Bobot vitamin E asetat}}{\text{volume}} \\ 100 \text{ ppm} &= \frac{100 \text{ mg}}{1000 \text{ mL}} \\ &= \frac{10 \text{ mg}}{100 \text{ mL}} \\ \text{Bobot vitamin E asetat} &= \frac{5 \text{ mg}}{50 \text{ mL}}\end{aligned}$$

1.1.2 Pengenceran Larutan

a. Konsentrasi 10 ppm

$$\begin{aligned}V_1 \times C_1 &= V_2 \times C_2 \\ V_1 \times 100 \text{ ppm} &= 5 \text{ ml} \times 10 \text{ ppm} \\ V_1 &= \frac{50 \text{ ml}}{100 \text{ ppm}} \\ V_1 &= 0,5 \text{ ml} = 500 \mu\text{L}\end{aligned}$$

b. Konsentrasi 9 ppm

$$\begin{aligned}V_1 \times C_1 &= V_2 \times C_2 \\ V_1 \times 100 \text{ ppm} &= 5 \text{ ml} \times 9 \text{ ppm} \\ V_1 &= \frac{45 \text{ ml}}{100 \text{ ppm}} \\ V_1 &= 0,45 \text{ ml} = 450 \mu\text{L}\end{aligned}$$

c. Konsentrasi 8 ppm

$$\begin{aligned}V_1 \times C_1 &= V_2 \times C_2 \\ V_1 \times 100 \text{ ppm} &= 5 \text{ ml} \times 8 \text{ ppm} \\ V_1 &= \frac{40 \text{ ml}}{100 \text{ ppm}} \\ V_1 &= 0,4 \text{ ml} = 400 \mu\text{L}\end{aligned}$$

d. Konsentrasi 7 ppm

$$\begin{aligned}V_1 \times C_1 &= V_2 \times C_2 \\ V_1 \times 100 \text{ ppm} &= 5 \text{ ml} \times 7 \text{ ppm} \\ V_1 &= \frac{35 \text{ ml}}{100 \text{ ppm}} \\ V_1 &= 0,35 \text{ ml} = 350 \mu\text{L}\end{aligned}$$

e. Konsentrasi 6 ppm

$$\begin{aligned}V_1 \times C_1 &= V_2 \times C_2 \\ V_1 \times 100 \text{ ppm} &= 5 \text{ ml} \times 6 \text{ ppm}\end{aligned}$$

$$V1 = \frac{30 \text{ ml}}{100 \text{ ppm}}$$

$$V1 = 0,3 \text{ ml} = 300 \text{ }\mu\text{L}$$

f. Konsentrasi 5 ppm

$$V1 \times C1 = V2 \times C2$$

$$V1 \times 100 \text{ ppm} = 5 \text{ ml} \times 5 \text{ ppm}$$

$$V1 = \frac{25 \text{ ml}}{100 \text{ ppm}}$$

$$V1 = 0,25 \text{ ml} = 250 \text{ }\mu\text{L}$$

g. Konsentrasi 4 ppm

$$V1 \times C1 = V2 \times C2$$

$$V1 \times 100 \text{ ppm} = 5 \text{ ml} \times 4 \text{ ppm}$$

$$V1 = \frac{20 \text{ ml}}{100 \text{ ppm}}$$

$$V1 = 0,2 \text{ ml} = 200 \text{ }\mu\text{L}$$

h. Konsentrasi 3 ppm

$$V1 \times C1 = V2 \times C2$$

$$V1 \times 100 \text{ ppm} = 5 \text{ ml} \times 3 \text{ ppm}$$

$$V1 = \frac{15 \text{ ml}}{100 \text{ ppm}}$$

$$V1 = 0,15 \text{ ml} = 150 \text{ }\mu\text{L}$$

i. Konsentrasi 2 ppm

$$V1 \times C1 = V2 \times C2$$

$$V1 \times 100 \text{ ppm} = 5 \text{ ml} \times 2 \text{ ppm}$$

$$V1 = \frac{10 \text{ ml}}{100 \text{ ppm}}$$

$$V1 = 0,1 \text{ ml} = 100 \text{ }\mu\text{L}$$

j. Konsentrasi 1 ppm

$$V1 \times C1 = V2 \times C2$$

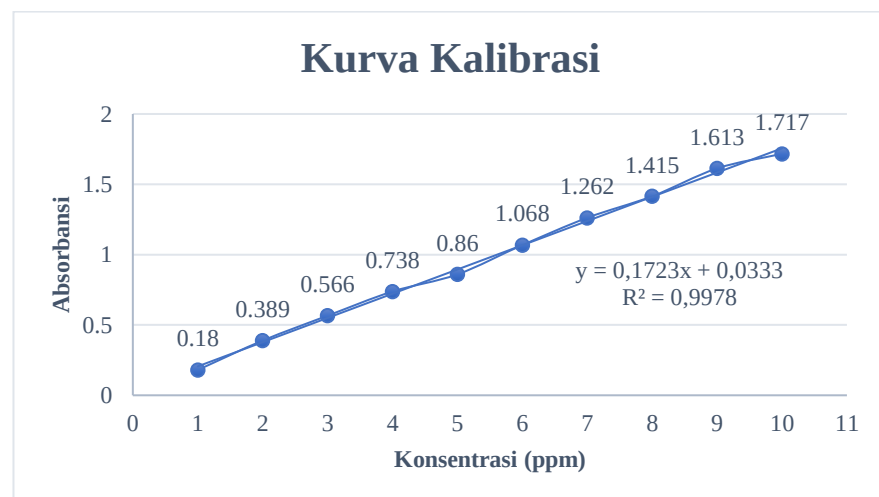
$$V1 \times 100 \text{ ppm} = 5 \text{ ml} \times 1 \text{ ppm}$$

$$V1 = \frac{5 \text{ ml}}{100 \text{ ppm}}$$

$$V1 = 0,05 \text{ ml} = 50 \text{ }\mu\text{L}$$

1.2 Kurva Kalibrasi Vitamin E Asetat

Konsentrasi	Absorbansi
1 ppm	0,18
2 ppm	0,389
3 ppm	0,566
4 ppm	0,738
5 ppm	0,86
6 ppm	1,068
7 ppm	1,262
8 ppm	1,415
9 ppm	1,613
10 ppm	1,717



Lampiran 3 Perhitungan %EE NLC Vitamin E Asetat

a. Konsentrasi Larutan

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

b. Bobot zat aktif bebas

$$\text{Bobot zat aktif bebas} = \text{konsentrasi} \times \text{volume} \times \text{fp}$$

c. Rumus %EE

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

Data Pengukuran Efisiensi Penjerapan Hari Ke-1

Form ula	Absorbansi			Efficiency Entrapment (%)			S D
	1	2	3	1	2	3	
F1	0,0	0,0	0,1	99.	98.	97.	0.
66	86	37	36	98	99	70	
F2	0.0	0,0	0,1	99.	99.	98.	0,
77	66	04	15	36	63	37	
F3	0,0	0,0	0,0	98.	98.	93.	0,
89	97	66	92	76	13	31	
F4	0,3	0,3	0,3	94.	93.	92.	0,
16	63	69	53	62	84	56	
F5	0,3	0,4	0,4	93.	92.	91.	0.
88	03	73	13	84	49	87	

Perhitungan

1. F1

a. Absorbansi 1

$$\text{Konsentrasi} = \frac{0,066-0,0333}{0,1723} = 1,8978 \text{ ppm}$$

$$\begin{aligned} \text{Bobot zat aktif bebas} &= 1,8978 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 1897,8 \text{ } \mu\text{g} \\ &= 1,8978 \text{ mg} \end{aligned}$$

$$\begin{aligned} \%EE &= \frac{30 \text{ mg} - 0.1897 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 99,36 \% \end{aligned}$$

b. Absorbansi 2

$$\text{Konsentrasi} = \frac{0,086-0,0333}{0,1723} = 0,3058 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 0,3058 \text{ ppm} \times 10 \text{ mL} \times 100$$

$$\begin{aligned}
 &= 305,86 \mu\text{g} \\
 &= 0,3058 \text{ mg} \\
 \%EE &= \frac{30 \text{ mg} - 0,3058 \text{ mg}}{30 \text{ mg}} \times 100\% \\
 &= 98,98\%
 \end{aligned}$$

c. Absorbansi 3

$$\begin{aligned}
 \text{Konsentrasi} &= \frac{0,137 - 0,0333}{0,1723} = 0.6018 \text{ ppm} \\
 \text{Bobot zat aktif bebas} &= 0.6018 \text{ ppm} \times 10 \text{ mL} \times 100 \\
 &= 601,857 \mu\text{g} \\
 &= 0,6018 \text{ mg} \\
 \%EE &= \frac{30 \text{ mg} - 0,6018 \text{ mg}}{30 \text{ mg}} \times 100\% \\
 &= 97,99\%
 \end{aligned}$$

2. F2

a. Absorbansi 1

$$\begin{aligned}
 \text{Konsentrasi} &= \frac{0,122 - 0,0077}{0,1723} = 0,25363 \text{ ppm} \\
 \text{Bobot zat aktif bebas} &= 0,25363 \text{ ppm} \times 10 \text{ mL} \times 100 \\
 &= 253,627 \mu\text{g} \\
 &= 0,2536 \text{ mg} \\
 \%EE &= \frac{30 \text{ mg} - 0,2536 \text{ mg}}{30 \text{ mg}} \times 100\% \\
 &= 99.15 \%
 \end{aligned}$$

b. Absorbansi 2

$$\begin{aligned}
 \text{Konsentrasi} &= \frac{0,066 - 0,0333}{0,1723} = 0,1879 \text{ ppm} \\
 \text{Bobot zat aktif bebas} &= 0,1879 \text{ ppm} \times 10 \text{ mL} \times 100 \\
 &= 189,785 \mu\text{g} \\
 &= 0,1897 \text{ mg} \\
 \%EE &= \frac{30 \text{ mg} - 0,1897 \text{ mg}}{30 \text{ mg}} \times 100\% \\
 &= 99,36\%
 \end{aligned}$$

c. Absorbansi 3

$$\begin{aligned}
 \text{Konsentrasi} &= \frac{0,104 - 0,0333}{0,1723} = 0,4103 \text{ ppm} \\
 \text{Bobot zat aktif bebas} &= 0,4103 \text{ ppm} \times 10 \text{ mL} \times 100
 \end{aligned}$$

$$\begin{aligned}
 &= 410,33 \mu\text{g} \\
 &= 0,4103 \text{ mg} \\
 \%EE &= \frac{30 \text{ mg} - 0,4103 \text{ mg}}{30 \text{ mg}} \times 100\% \\
 &= 98,63\%
 \end{aligned}$$

3. F3

a. Absorbansi 1

$$\begin{aligned}
 \text{Konsentrasi} &= \frac{0,0889 - 0,0333}{0,1723} = 0,32327 \text{ ppm} \\
 \text{Bobot zat aktif bebas} &= 0,32327 \text{ ppm} \times 10 \text{ mL} \times 100 \\
 &= 323,27 \mu\text{g} \\
 &= 0,32327 \text{ mg} \\
 \%EE &= \frac{30 \text{ mg} - 0,32327 \text{ mg}}{30 \text{ mg}} \times 100\% \\
 &= 98,92 \%
 \end{aligned}$$

b. Absorbansi 2

$$\begin{aligned}
 \text{Konsentrasi} &= \frac{0,097 - 0,0333}{0,1723} = 0,3697 \text{ ppm} \\
 \text{Bobot zat aktif bebas} &= 0,3697 \text{ ppm} \times 10 \text{ mL} \times 100 \\
 &= 369,703 \mu\text{g} \\
 &= 0,3697 \text{ mg} \\
 \%EE &= \frac{30 \text{ mg} - 0,3697 \text{ mg}}{30 \text{ mg}} \times 100\% \\
 &= 98,76 \%
 \end{aligned}$$

c. Absorbansi 3

$$\begin{aligned}
 \text{Konsentrasi} &= \frac{0,066 - 0,0333}{0,1723} = 0,1897 \text{ ppm} \\
 \text{Bobot zat aktif bebas} &= 0,1897 \text{ ppm} \times 10 \text{ mL} \times 100 \\
 &= 189,78 \mu\text{g} \\
 &= 0,1897 \text{ mg} \\
 \%EE &= \frac{30 \text{ mg} - 0,1897 \text{ mg}}{30 \text{ mg}} \times 100\% \\
 &= 99,36\%
 \end{aligned}$$

4. F4

a. Absorbansi 1

$$\begin{aligned}
 \text{Konsentrasi} &= \frac{0,316 - 0,0333}{0,1723} = 1,6407 \text{ ppm} \\
 \text{Bobot zat aktif bebas} &= 1,6407 \text{ ppm} \times 10 \text{ mL} \times 100 \\
 &= 1640,7 \mu\text{g}
 \end{aligned}$$

$$\begin{aligned} &= 1,6407 \text{ mg} \\ \%EE &= \frac{30 \text{ mg} - 1,6407 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 94,53 \% \end{aligned}$$

b. Absorbansi 2

$$\begin{aligned} \text{Konsentrasi} &= \frac{0,363 - 0,0333}{0,1723} = 1,9135 \text{ ppm} \\ \text{Bobot zat aktif bebas} &= 1,9135 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 1913,5 \text{ } \mu\text{g} \\ &= 1,9135 \text{ mg} \\ \%EE &= \frac{30 \text{ mg} - 1,9135 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 93,62 \% \end{aligned}$$

c. Absorbansi 3

$$\begin{aligned} \text{Konsentrasi} &= \frac{0,369 - 0,0333}{0,1723} = 1,9483 \text{ ppm} \\ \text{Bobot zat aktif bebas} &= 1,9483 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 1948,3 \text{ } \mu\text{g} \\ &= 1,9483 \text{ mg} \\ \%EE &= \frac{30 \text{ mg} - 1,9483 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 93,50 \% \end{aligned}$$

5. F5

a. Absorbansi 1

$$\begin{aligned} \text{Konsentrasi} &= \frac{0,388 - 0,0333}{0,1723} = 2,0586 \text{ ppm} \\ \text{Bobot zat aktif bebas} &= 2,0586 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 2058,6 \text{ } \mu\text{g} \\ &= 2,0586 \text{ mg} \\ \%EE &= \frac{30 \text{ mg} - 2,0586 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 93,13 \% \end{aligned}$$

b. Absorbansi 2

$$\begin{aligned} \text{Konsentrasi} &= \frac{0,403 - 0,0333}{0,1723} = 2,1456 \text{ ppm} \\ \text{Bobot zat aktif bebas} &= 2,1456 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 2145,6 \text{ } \mu\text{g} \\ &= 2,1456 \text{ mg} \\ \%EE &= \frac{30 \text{ mg} - 2,1456 \text{ mg}}{30 \text{ mg}} \times 100\% \end{aligned}$$

$$= 92,84\%$$

c. Absorbansi 3

$$\text{Konsentrasi} = \frac{0,473-0,0333}{0,1723} = 2,5519 \text{ ppm}$$

$$\begin{aligned} \text{Bobot zat aktif bebas} &= 2,5519 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 2551,9 \mu\text{g} \\ &= 2,5519 \text{ mg} \end{aligned}$$

$$\begin{aligned} \%EE &= \frac{30 \text{ mg} - 2,5519 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 91,49\% \end{aligned}$$

Data Pengukuran Efisiensi Penjerapan Hari Ke-30

Form ula	Absorbansi			Efficiency Entrapment (%)			S D
	1	2	3	1	2	3	
F1	0,1	0,1	0,1	97.	97.	97.	0.
	77	53	53	22	68	68	26
F2	0,2	0,3	0,2	94.	94.	94.	0,
	49	99	82	84	85	56	
F3	0,1	0,1	0,2	97.	97.	96.	0,
	84	49	19	08	76	40	67
F4	0,4	0,3	0,3	92.	93.	94.	0,
	34	58	42	24	71	02	95
F5	0,3	0,4	0,6	93.	92.	88.	2,
	9	46	16	09	01	72	27

Perhitungan

1. F1

a. Absorbansi 1

$$\text{Konsentrasi} = \frac{0,177-0,0333}{0,1723} = 0,8340 \text{ ppm}$$

$$\begin{aligned} \text{Bobot zat aktif bebas} &= 0,8340 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 834,01 \mu\text{g} \\ &= 0,8340 \text{ mg} \end{aligned}$$

$$\begin{aligned} \%EE &= \frac{30 \text{ mg} - 0,8340 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 97,22 \% \end{aligned}$$

b. Absorbansi 2

$$\text{Konsentrasi} = \frac{0,153-0,0333}{0,1723} = 0,6947 \text{ ppm}$$

$$\begin{aligned} \text{Bobot zat aktif bebas} &= 0,6947 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 694,719 \mu\text{g} \end{aligned}$$

$$\begin{aligned}
 &= 0,6947 \text{ mg} \\
 \%EE &= \frac{30 \text{ mg} - 0,6947 \text{ mg}}{30 \text{ mg}} \times 100\% \\
 &= 97,68 \%
 \end{aligned}$$

c. Absorbansi 3

$$\begin{aligned}
 \text{Konsentrasi} &= \frac{0,153 - 0,0333}{0,1723} = 0,6947 \text{ ppm} \\
 \text{Bobot zat aktif bebas} &= 0,6947 \text{ ppm} \times 10 \text{ mL} \times 100 \\
 &= 694,71 \text{ } \mu\text{g} \\
 &= 0,6947 \text{ mg} \\
 \%EE &= \frac{30 \text{ mg} - 0,6947 \text{ mg}}{30 \text{ mg}} \times 100\% \\
 &= 97,68 \%
 \end{aligned}$$

2. F2

a. Absorbansi 1

$$\begin{aligned}
 \text{Konsentrasi} &= \frac{0,249 - 0,0333}{0,1723} = 1,2518 \text{ ppm} \\
 \text{Bobot zat aktif bebas} &= 1,2518 \text{ ppm} \times 10 \text{ mL} \times 100 \\
 &= 1251,89 \text{ } \mu\text{g} \\
 &= 1,2518 \text{ mg} \\
 \%EE &= \frac{30 \text{ mg} - 1,2518 \text{ mg}}{30 \text{ mg}} \times 100\% \\
 &= 95,82 \%
 \end{aligned}$$

b. Absorbansi 2

$$\begin{aligned}
 \text{Konsentrasi} &= \frac{0,3 - 0,0333}{0,1723} = 1,5478 \text{ ppm} \\
 \text{Bobot zat aktif bebas} &= 1,5478 \text{ ppm} \times 10 \text{ mL} \times 100 \\
 &= 1547,8 \text{ } \mu\text{g} \\
 &= 1,5478 \text{ mg} \\
 \%EE &= \frac{30 \text{ mg} - 1,5478 \text{ mg}}{30 \text{ mg}} \times 100\% \\
 &= 94,84 \%
 \end{aligned}$$

c. Absorbansi 3

$$\begin{aligned}
 \text{Konsentrasi} &= \frac{0,299 - 0,0333}{0,1723} = 1,5420 \text{ ppm} \\
 \text{Bobot zat aktif bebas} &= 1,5420 \text{ ppm} \times 10 \text{ mL} \times 100 \\
 &= 1542,08 \text{ } \mu\text{g} \\
 &= 1,5420 \text{ mg} \\
 \%EE &= \frac{30 \text{ mg} - 1,5420 \text{ mg}}{30 \text{ mg}} \times 100\%
 \end{aligned}$$

$$= 94,85 \%$$

3. F3

a. Absorbansi 1

$$\text{Konsentrasi} = \frac{0,184-0,0333}{0,1723} = 0,8746 \text{ ppm}$$

$$\begin{aligned} \text{Bobot zat aktif bebas} &= 0,8746 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 874,637 \mu\text{g} \\ &= 0,8746 \text{ mg} \end{aligned}$$

$$\begin{aligned} \%EE &= \frac{30 \text{ mg} - 0,8746 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 97,08 \% \end{aligned}$$

b. Absorbansi 2

$$\text{Konsentrasi} = \frac{0,149-0,0333}{0,1723} = 0,6715 \text{ ppm}$$

$$\begin{aligned} \text{Bobot zat aktif bebas} &= 0,6715 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 671,50 \mu\text{g} \\ &= 0,6715 \text{ mg} \end{aligned}$$

$$\begin{aligned} \%EE &= \frac{30 \text{ mg} - 0,6715 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 97,76 \% \end{aligned}$$

c. Absorbansi 3

$$\text{Konsentrasi} = \frac{0,219-0,0333}{0,1723} = 1,0777 \text{ ppm}$$

$$\begin{aligned} \text{Bobot zat aktif bebas} &= 1,0777 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 1077,7 \mu\text{g} \\ &= 1,0777 \text{ mg} \end{aligned}$$

$$\begin{aligned} \%EE &= \frac{30 \text{ mg} - 1,0777 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 96,40 \% \end{aligned}$$

4. F4

a. Absorbansi 1

$$\text{Konsentrasi} = \frac{0,434-0,0333}{0,1723} = 2,3255 \text{ ppm}$$

$$\begin{aligned} \text{Bobot zat aktif bebas} &= 2,3255 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 2325,59 \mu\text{g} \\ &= 2,3255 \text{ mg} \end{aligned}$$

$$\begin{aligned} \%EE &= \frac{30 \text{ mg} - 2,3255 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 92,24 \% \end{aligned}$$

b. Absorbansi 2

$$\begin{aligned}\text{Konsentrasi} &= \frac{0,358-0,0333}{0,1723} = 1,8845 \text{ ppm} \\ \text{Bobot zat aktif bebas} &= 1,8845 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 1884,5 \text{ } \mu\text{g} \\ &= 1,8845 \text{ mg} \\ \%EE &= \frac{30 \text{ mg}-1,8845 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 93,71 \%\end{aligned}$$

c. Absorbansi 3

$$\begin{aligned}\text{Konsentrasi} &= \frac{0,342-0,0333}{0,1723} = 1,7916 \text{ ppm} \\ \text{Bobot zat aktif bebas} &= 1,7916 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 1791,6 \text{ } \mu\text{g} \\ &= 1,7916 \text{ mg} \\ \%EE &= \frac{30 \text{ mg}-1,7916 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 94,02 \%\end{aligned}$$

5. F5

a. Absorbansi 1

$$\begin{aligned}\text{Konsentrasi} &= \frac{0,39-0,0333}{0,1723} = 2,0702 \text{ ppm} \\ \text{Bobot zat aktif bebas} &= 2,0702 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 2070,2 \text{ } \mu\text{g} \\ &= 2,0702 \text{ mg} \\ \%EE &= \frac{30 \text{ mg}-2,0702 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 93,09 \%\end{aligned}$$

b. Absorbansi 2

$$\begin{aligned}\text{Konsentrasi} &= \frac{0,446-0,0333}{0,1723} = 2,3952 \text{ ppm} \\ \text{Bobot zat aktif bebas} &= 2,3952 \text{ ppm} \times 10 \text{ mL} \times 100 \\ &= 2395,2 \text{ } \mu\text{g} \\ &= 2,3952 \text{ mg} \\ \%EE &= \frac{30 \text{ mg}-2,3952 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 92,01 \%\end{aligned}$$

c. Absorbansi 3

$$\text{Konsentrasi} = \frac{0,616-0,0333}{0,1723} = 3,3818 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 3,3818 \text{ ppm} \times 10 \text{ mL} \times 100$$

$$= 3381,8 \text{ } \mu\text{g}$$

$$= 3,3818 \text{ mg}$$

$$\% \text{EE} = \frac{30 \text{ mg} - 3,3818 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 88,72 \%$$

Lampiran 4 Hasil Karakterisasi NLC Vitamin E Asetat

Data Karakterisasi NLC Vitamin E Asetat Hari Ke-1

Formula	Ukuran Partikel (nm)	PdI	Zeta Potensial (mV)	Entrapment Efficiency (%)
F1	363.56±95.15	0.44±0.074	- 15.5±1.228	98.78±0.70
F2	103.13±1.75	0.154±0.016	- 17.63±0.305	99.05±0.37
F3	196.43±8.56	0.266±0.075	- 14.94±0.351	99.02±0.31
F4	184.43±2.34	0.188±0.011	-29.4±1.3	93.88±0.56
F5	151.23±1.16	0.243±0.014	- 12.63±0.45	92.49±0.87

Data Karakterisasi NLC Vitamin E Asetat Hari Ke-30

Formula	Ukuran Partikel (nm)	PdI	Zeta Potensial (mV)	Entrapment Efficiency (%)
F1	107.3±1.17	0.13±0.037	- 18.13±0.635	97.52±0.26
F2	253.467±159.54	0.457±0.130	- 23.63±1.446	95.17±0.56
F3	742.4±96.00	0.721±0.044	- 18.9±1.228	97.08±0.67
F4	223.5±4.59	0.315±0.016	- 17.93±0.404	93.330.95
F5	130.56±0.57	0.152±0.048	- 10.24±9.143	91.28±2.27

Lampiran 5 Hasil Uji T-Test Karakterisasi NLC Vitamin E Asetat

Paired Samples Test									
		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
	F1_UkuranPartikel_H1 -	56.26667	94.15425	54.35998	22.37454	490.15880	4.714	.042	
air 1	F1_UkuranPartikel_H30								
	F1_PdI_H1 -	.3	.07	.04	.11	.50	.6	.02	
air 2	F1_PdI_H30	1000	686	438	906	094	.986	0	
	F1_ZetaPotensial_H1 -	2.	1.8	1.0	-	7.2	2	.13	
air 3	F1_ZetaPotensial_H30	63333	5831	7290	1.98298	4964	.454	4	
	F1_EE_H1 -	1.	.91	.53	-	3.5	2	.14	
air 4	F1_EE_H30	25105	977	103	1.03379	3589	.356	3	
	F2_UkuranPartikel_H1 -	150.33333	0.74142	92.80410	-	248	-	.24	
air 5	F2_UkuranPartikel_H30			549.63715	.97048	1.620	2	7	
	F2_PdI_H1 -	-	.11	.06	-	-	-	.04	
air 6	F2_PdI_H30	.30300	447	609	.58737	.01863	4.585	4	
	F2_ZetaPotensial_H1 -	6.	1.4	.83	2.4	9.5	7	.01	
air 7	F2_ZetaPotensial_H30	00000	4222	267	1733	8267	.206	9	
	F2_EE_H1 -	3.	.60	.35	2.3	5.3	1	.00	
air 8	F2_EE_H30	87567	635	008	6941	8192	1.071	8	
	F3_UkuranPartikel_H1 -	545.96667	4.50652	60.33687	-	-	-	.01	
air 9	F3_UkuranPartikel_H30			805.57526	286.35807	9.049	2	2	
	F3_PdI_H1 -	-	.11	.06	-	-	-	.02	
air 10	F3_PdI_H30	.45533	521	652	.74154	.16913	6.845	1	
	F3_ZetaPotensial_H1 -	3.	1.0	.58	1.4	6.4	6	.02	
air 11	F3_ZetaPotensial_H30	96667	0664	119	6602	6731	.825	1	

	F3_EE_H1 -	1.	.98	.56	-	4.3	3		.07
air 12	F3_EE_H30	93461	056	613	.50124	7046	.417	2	6
	F4_UkuranP	-							
	artikel_H1 -	-	5.1	2.9	-	-	-	2	.00
air 13	F4_UkuranPartikel_H30	39.06667	3160	6273	51.81427	26.31906	13.186	2	6
	F4_PdI_H1 -	-	.01	.00	-	-	-	2	.00
air 14	F4_PdI_H30	.12700	082	624	.15387	.10013	20.336	2	2
	F4_ZetaPotensial_H1 -	-	1.6	.94	-	-	-	2	.00
air 15	F4_ZetaPotensial_H30	11.46667	4418	927	15.55104	7.38229	12.079	2	7
	F4_EE_H1 -	.5	1.5	.87	-	4.3	.	2	.59
air 16	F4_EE_H30	5459	1176	282	3.20084	1002	635	2	0
	F5_UkuranP	-							
	artikel_H1 -	2	1.7	.99	16.	24.	2	2	.00
air 17	F5_UkuranPartikel_H30	0.66667	2143	387	39039	94294	0.794	2	2
	F5_PdI_H1 -	.0	.05	.02	-	.21	3	2	.09
air 18	F5_PdI_H30	9100	126	960	.03635	835	.075	2	1
	F5_ZetaPotensial_H1 -	-	9.5	5.5	-	21.	-	2	.70
air 19	F5_ZetaPotensial_H30	2.39233	3190	0325	26.07089	28623	.435	2	6
	F5_EE_H1 -	1.	1.4	.81	-	4.6	1	2	.27
air 20	F5_EE_H30	21236	0314	010	2.27323	9794	.497	2	3

Lampiran 6 Dokumentasi Penelitian



Lampiran 7 Format Surat Pernyataan Bebas Plagiasi

SURAT PERNYATAAN

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