DAFTAR PUSTAKA

Abdullah, M., dan Khairurrijalah, 2009, Karakterisasi Nanomaterial, *Jurnal Nanosains dan Nanoteknologi*, **2**(1):1-9.

Ankana, S., 2010, Production of Biogenic Silver Nanoparticle Using *Boswellia ovalifoliolata*, *Digest Journal of Nanomaterials and Biostructures*, **5**(2): 369-372.

Asmathunisha, N., dan Kathiresan, K., 2013, A Review on Biosynthesis of Nanoparticles by Marine Organisms, *Colloids and Surfaces B: Biointerfaces*, **103**: 283–287.

Bahriul, P., Rahman, N., dan Diah, A. W. M., 2014, Uji Aktivitas Antioksidan Ekstrak Daun Salam (*Syzygium Polyanthum*) dengan Menggunakan 1,1-Difenil-2-Pikrilhidrazil, *J. Akad. Kim*, **3**(3): 143-149.

Bakir, 2011, *Pengembangan Biosintesis Nanopartikel Perak Menggunakan Air Rebusan Daun Bisbul (Diospyros blancoi) untuk Deteksi Ion Tembaga Cu (II) dengan Metode Kolorimetri*, Skripsi Tidak Diterbitkan, Program Studi Fisika FMIPA Universitas Indonesia, Depok.

Bar, H., Bhui, D. K., Sahoo, G. P., Sarkar, P., De, S. P., dan Misra, A., 2009, Green Synthesis of Silver Nanoparticles using Latex of *Jatropha curcas*, *Colloids and Surfaces A: Physicochemistry Engineering Aspects 339*, 134-139.

Bunghez, I. R., Patrascu, M. E. B., Badea, N., Doncea, S. M., Popescu, A., dan Ion, R. M., 2012. Antioxidant Silver Nanoparticles Green Synthesized using Ornamental Plants, *Journal of Optoelectronics and Advanced Materials*, **11**(14): 1016-1022.

Chandran, S. P., Chaundhary, M., Pasricha, R., Ahmad, A., dan Sastry, M., 2006, Synthesis of Gold Nanotriangel and Silver Nanoparticles using Aloe Vera Plant Extract, *Biotecnology Progress*, **22**(2): 577-538.

Dalimartha, S., 2005, *Tanaman Obat di Lingkungan Sekitar*, Puspa Swara, Jakarta.

Das, R., Nath, S. S., Chakdar, D., dan Gope, G, 2009, Preparation of Silver Nanoparticles and their Characterization Synthesis of Silver Nanoparticles, *Journal of Materials Online*, 1–9.

K. M. M. A., Eftaiha, A., Al-Warthan, A. dan Ammar, R. A. A., 2010, hesis and Application of Silver Nanoparticles, *Arabian Journal of mistry*, **3**: 135–140.

Elumalai, E. K., Prasad, P. C., Nagajyothi dan David, E., 2011, A Bird's Eye View on Biogenic Silver Nanoparticles and their Application. *Pelagia Research Library*, **2**(2): 88-97.

Handayani, W., Bakir, Imawan, C., dan Purbaningsih, S., 2010, Potensi Ekstrak Beberapa Jenis Tumbuhan Sebagai Agen Pereduksi untuk Biosintesis Nanopartikel Perak, *Seminar Nasional Biologi*, 558-567.

Hasmiah, 2012, *Penggunaan Natrium Silikat dari Bahan Dasar Abu Sekam Padi Sebagai Elektrolit Pelapis dalam Sintesis Nanopartikel Magnetik*, Skripsi Tidak Diterbitkan, Jurusan Kimia FMIPA Universitas Hasanuddin, Makassar.

Haryono, A., Sondari, D., Harmami, S. B., dan Randy, M., 2008, Sintesa Nanoparikel Perak dan Potensi Aplikasinya, *Jurnal Riset Industri*, **2**(3): 155-163.

Hasanah, N., 2015, Aktivitas Antioksidan Ektrak Etanol Daun Salam, *Jurnal Pena Medika*, **5**(1): 55-59.

Horiba Scientific, 2012, *A Guide Book to Particle Size Analysis*, Horiba Instrumen, Inc., Irvine USA, 1-18.

Indrayana, R., 2008, *Efek Antioksidan Ekstrak Etanol 70% Daun Salam (Syzygium polyantum wight. Walp Pada Serum Darah Tikus Putih Jantan Galur Wistar yang Diinduksi Karbon Tetraklorida (CCl_4)*, Skripsi Tidak Diterbitkan, Universitas Muhammadiyah Surakarta, Surakarta.

Irwan, R., 2017, Biosintesis Nanopartikel Perak Menggunakan Ekstrak Kulit Buah Manggis, Modifikasi dan Aplikasi dalam Deteksi Melanin, Tesis Tidak Diterbitkan, Universitas Hasanuddin, Makassar.

Irvina, F. W. H., Danik, W. A., dan Fatimah, 2009, *X-Ray Diffraction (XRD)*, Program Studi Kimia Fakultas Teknik, Universitas Sebelas Maret.

Jain, D., Daima, H. K., Kochhwaha, S., dan Kothari, S. L., 2009, Synthesis of Plant – Mediated Silver Nanoparticle Using Papaya Fruit Extract and Evaluation of their Anti Microbial Activities, *Journal of Nanomaterials and Biostructures*, **4**(3): 557-563.

Keat, C. L., Aziz, A., Eid, A. M., dan Elmarguzi, N. A., 2015, Biosynthesis of Nanoparticles and Silver Nanoparticles, *Bioresources and Bioprocessing*, **2015**(2): 47–57.

V., Yadav, S. C., dan Yadav, S. K., 2010, *Syzigim cumini* Leaf and Seed Ekstrak Mediated Biosinthesis of Silver Nanoparticles and their Characterization, *Journal Chemistry Technology and Biotechnology*, 1-9.

Latifah, 2015, Identifikasi Golongan Senyawa Flavonoid dan Uji Aktivitas Antioksidan pada Ekstrak Rimpang Kencur *Kaempferia galanga* L. dengan Metode DPPH (1,1-Difenil-2-Pikrilhidrazil), Skripsi Tidak Diterbitkan, Universitas Islam Negeri Maulana Ibrahim Malang, Malang.

Lauterwasser, C., 2007, Small Sizes that Matter: Opportunities and Risks of Nanotechnologies, *OECD International Futures Programme*, Allianz Centre for Technology, München, Germany.

Lembang, E. Y., Maming, dan Zakir, M., 2013, *Sintesis Nanopartikel Perak dengan Metode Reduksi Menggunakan Bioreduktor Ekstrak Daun Ketapang (Terminalia catappa),* Repository, Universitas Hasanuddin, Makassar.

Mailandari, M., 2012, *Uji Aktivitas Antioksidan Ekstrak Daun Garcinia kydia roxb dengan Metode DPPH dan Identifikasi Senyawa Kimia Fraksi yang Aktif,* Skripsi Tidak Diterbitkan, Universitas Indonesia, Depok.

Margaretta, S., Swita, D. H., Nani, I., dan Herman, H., 2011, Ekstraksi Senyawa Phenolic *Pandanus AmaryllifoliusRoxb* Sebagai Antioksidan Alami, *Widya Teknik*, **10**(1): 21-30.

Markham, K. R., 1988, *Cara Mengidentifikasi Flavonoida*, Terjemahan Kosasih Padmawinata, ITB, Bandung.

Masakke, Y., Rasyid, M., dan Sulfikar, 2014, Biosintesis Nanopartikel Perak Menggunakan Ekstrak Metanol Daun Manggis (*Garcinia mangostana* L.), *Jurnal Chemical*, **5**(2): 45-57.

Matutu, J. M., Maming, dan Taba, P., 2014, Sintesis Nanopartikel Perak dengan Metode Reduksi Menggunakan Buah Merah (*Pandanus conoideus*) Sebagai Bioreduktor, Repository, Universitas Hasanuddin, Makassar.

Mittal, D. R., 2011, *Nature of Interaction Between Metal Nanoparticles (Ag) dan Bacterial Cell (E. coli)*, Tesis Tidak Diterbitkan, Departement of Biotechnology and Medical Engineering, National Institute of Technology Rourkela, Rourkela.

Mittal, A. K., Kaler, A., dan Banerjee, U. C., 2012, Free Radical Scavenging And Antioxidant Activity of Silver Nanoparticles Synthesized from Flower Extract of Rhododendrondauricum, *Nano Biomedicinal Engenering*, **4**(3): 118-124.

Molyneux, P., 2013, The Use of the Stable Free Radicals Diphenylpicrylhydrazyl (DPPH) for Estimating Antioxidant Activity. *Songklanakarin Journal of Science Technolog*, **26**(2): 211-219.

Nagarajan, R., dan Hatton, T. A., 2008, Nanoparticle; Synthesis, Stabilizator, Passivation, and Functionalition, *ACS Symposium Series*, American Chemical Society, Wshington DC.

Nath, D. dan Banerjee, P., 2013, Green Nanotechnology - A New Hope for Medical Biology, *Environmental Toxicology and Pharmacology*, **36**(3): 997–1014.

Nikmatin, S., Maddu, A., Purwanto, S., Mandang, T., dan Purwanto A., 2011, Analisa Struktur Mikro Pemanfaatan Limbah Kulit Rotan Menjadi Nanopartikel Selulosa Sebagai Pengganti Serat Sintetis, *Jurnal Biofisika*, **7(**1): 41-49.

Nurafni, 2018, Sintesis Nanopartikel Perak Menggunakan Bioreduktor Ekstrak Daun Kersen (*Muntingia calabura* L.) dan Potensinya Sebagai Nanosensor Gula Darah, Skripsi Tidak Diterbitkan, Universitas Hasanuddin, Makassar.

Oldenburg, S., Samberg, Meghan, dan Monteiro-Riviere, N., 2010, Evolution of Silver Nanoparticle Toxicity in Vivo Skin and in Vitro Keratinocytes, *Environmental Health Perspective*, **118**(3): 407-413.

Purnamasari, M. D., 2015, Sintesis Antibakteri Nanopartikel Perak Menggunakan Bioreduktor Ekstrak Daun Sirih (*Piper betle* Linn.) dengan Irradiasi Microwave, Skripsi Tidak Diterbitkan, Universitas Negeri Semarang, Semarang.

Ponarulselvam, S., Panneerselvam, C., Murugan, K., Aarthi, N., Kalimuthu, K. dan Thangamani, S. 2012. Synthesis of Silver Nanoparticles using Leaves of *Catharanthus roseus* Linn. G. Don and their Antiplasmodial Activities, *Asian Pac. J. Trop. Biomed*, 547-580.

Rahim, A., 2012, Uji Aktivitas Antioksidan dengan Metode 1,1-Difenil-2-Pikrilhidrazil (DPPH) dan Uji Terpenoid terhadap Ekstrak *Acanthaster*, Skripsi Tidak Diterbitkan, Universitas Indonesia, Depok.

Raman, N., Sudharsan, S., Veerakumar, V., Pravin, N., dan Vithiya, K. 2012. *Pithecellobium dulce* Mediated Extracellular Green Synthesis of Larvicidal Silver Nanoparticles, *Spectrochim. Acta. Part A*, **96**: 103-1037.

Rath, M., Panda, S. S. dan Dhal, N. K, 2014, Synthesis of Silver Nanoparticles from Plant Extract and its Application on Cancer Treatment: A Review. *International Journal of Plant, Animal and Environmental Sciences*, **4**(3): 137–145.

K. F., 2007, Green Nanotechnology: It's Easier Than You Think. *Project on Emerging Nanotechnology, Woodwraw Wilson International Center for Scholars*, **8**: 1–36.

Shankar, S. S., Ahmad, A., dan Sastry, M., 2003, Geranium Leaf Assisted Biosynthesis of Silver Nanoparticles, *Biotechnology Progress*, **19**: 1627-1631.

Shankar, S. S., Rai, A., Ahmad, A., dan Sastry, M., 2004, Rapid Synthesis of Au, Ag, and Bimetalic Au Core-Ag Shell Nanoparticles using Neem (*Azadirachta indica*) Leaf Broth, *Journal of Colloid and Interface Science*, **275**(2): 496-502.

Sharma, V. K., Yngard, R. A., dan Lin, Y., 2009, Silver Nanoparticles: Green Synthesis and their Antimicrobial Activities, *Advances in Colloid and Interface Science*, **145**(1–2): 83–96.

Singh, A., S. Jha, G. Srivastava, P. Sarkar, dan P. Gogoi, 2013, Silver Nanoparticles as Fluorescent Probes: New Approach For Bioimaging, *International Journal of Scientific & Technology Research*, **2**(11): 153-157.

Skoog, D. A., Holler, F. J., dan Crouch, S. R., 2007, *Principles of Instrumental Analysis*, 6th Edition, Thompson Brooks/Cole, USA, hal: 955-957.

Sudirman, T. A., 2014, Uji Efektivitas Ekstrak Daun Salam (*Eugenia polyantha*) Terhadap Pertumbuhan *Staphylococcus aureus* Secara In Vitro, Skripsi Tidak Diterbitkan, Universitas Hasanuddin, Makassar.

Sumono, A., dan Wulan, A., 2008, the Use of Bay Leaf (*Eugenia polyantha Wight*) in Dentistry, *Dental Journal*, **41**(3): 147-150.

Solomon, S. D., Bahadory, M., Jeyarajasingam, A. V., Rutkowsky, S. A., dan Borits, C., 2007, Synthesis and Study of Silver Nanoparticle, *J. Chem. Edu*, **84**(2): 322-325.

Tapa, F. L., Suryanto, E., dan Momuat, L. I., 2016, Biosintesis Nanopartikel Perak Menggunakan Ekstrak Empelur Batang Sagu Baruk (*Arenga microcarpha*) dan Aktivitas Antioksidannya, *Chem. Prog*, **9**(1): 9-15.

Umadevi, M., Bindhu, M. R. dan Sathe, V. 2013, A Novel Synthesis of Malic Acid Capped Silver Nanoparticles using *Solanum lycopersicums* Fruit Extract. *J. Mater. Sci. Technol*, **29**(4): 317-322.

Uner, M., 2015, Characterization and Imaging of Solid Lipid Nanoparticle and Nanostructured Lipid Carriers, *Handbook of Nanoparticles*, 117-141.

Wahyudi, T., dan Rismayani, S., 2008, Aplikasi Nanoteknologi pada Bidang Tekstil, *Arena Tekstil*, **23**(2): 52-109.

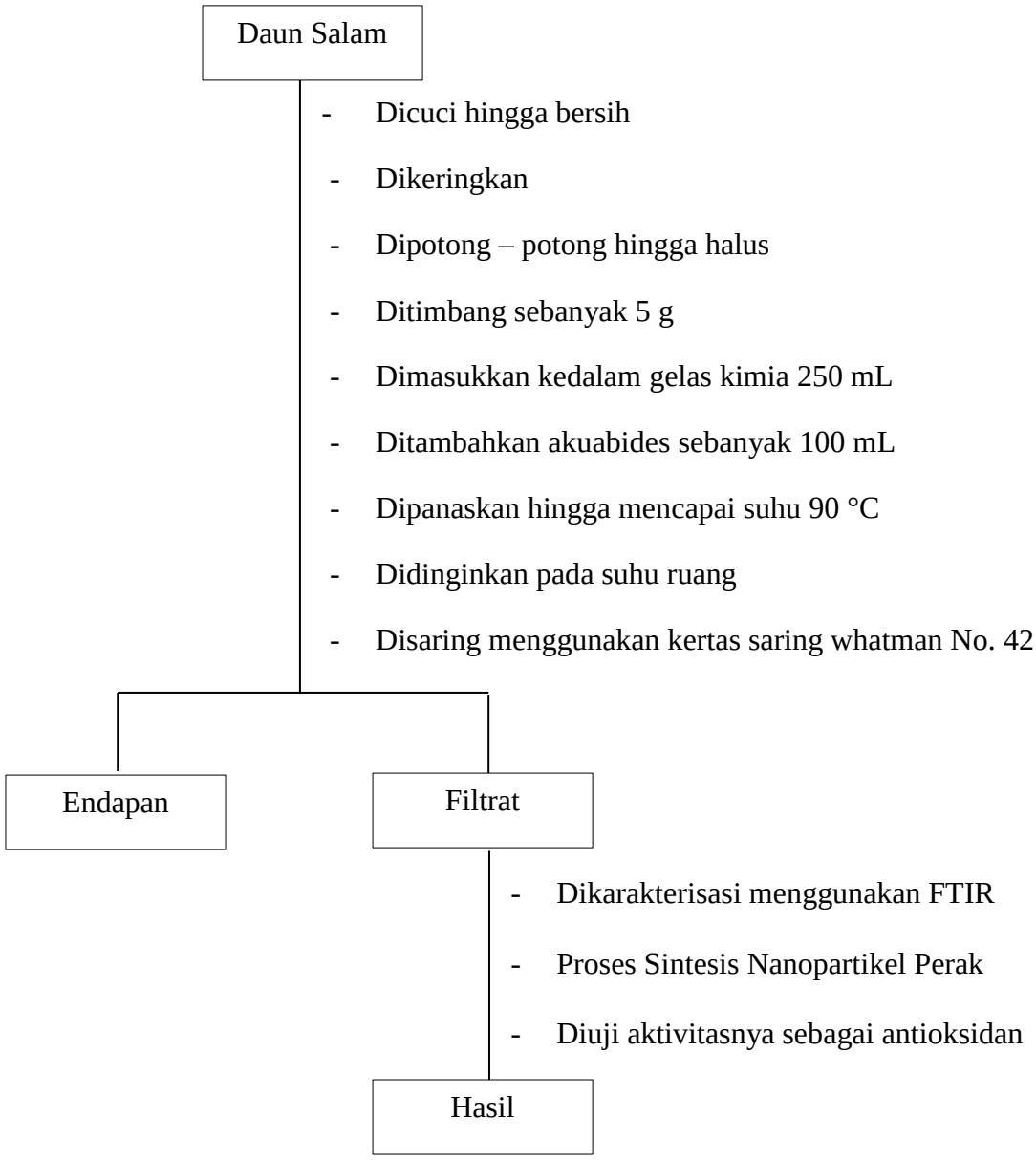
. L., Yin, H. B., Ren, M., Cheng, Q., Zhou, F., dan Zhang, X. F., 2008, Effect of Different Group Containing Organics on Morphology Controlled Synthesis of Nanoparticles at Room Temperature, *Acta Metallurgica Sininica (English Letter)*, **19**(5): 362-370.

Winarto, W. P., 2004, *Memanfaatkan Bumbu Dapur untuk Mengatasi Aneka Penyakit*, Agromedia Pustaka, Jakarta.

Yousefzadi, M., Rahimi, Z., dan Ghafori, V. 2014. The Green Synthesis, Characterization and Antimicrobial Activities of Silver Nanoparticles Synthesized from Green Alga *Enteromorpha flexuosa* (wulfen) J.Agardh. *Mater. Lett*, **137**: 1-4.

Lampiran 1. Bagan Kerja Preparasi Sampel dan Pembuatan Larutan $AgNO_3$ Variasi Konsentrasi

1. Pembuatan Ekstrak Daun Salam



2. **Pembuatan Larutan $AgNO_3$ variasi konsentrasi 2 mM; 1,5 mM; 1 mM; dan 0,5 mM**

Serbuk $AgNO_3$

- Ditimbang sebanyak 0,0850 g
- Dilarutkan ke dalam akuabides hingga volume 200 mL
- Dihomogenkan untuk menghasilkan larutan $AgNO_3$ 2 mM.

Larutan $AgNO_3$ 2 mM

- Dipipet sebanyak 37,5 mL, 25 mL, 12,5 mL
- Dimasukkan ke dalam masing-masing labu ukur 50 mL
- Ditambahkan akuabides hingga tanda batas
- Dihomogenkan

Larutan $AgNO_3$ variasi konsentrasi 1,5 mM; 1 mM; dan 0,5 mM

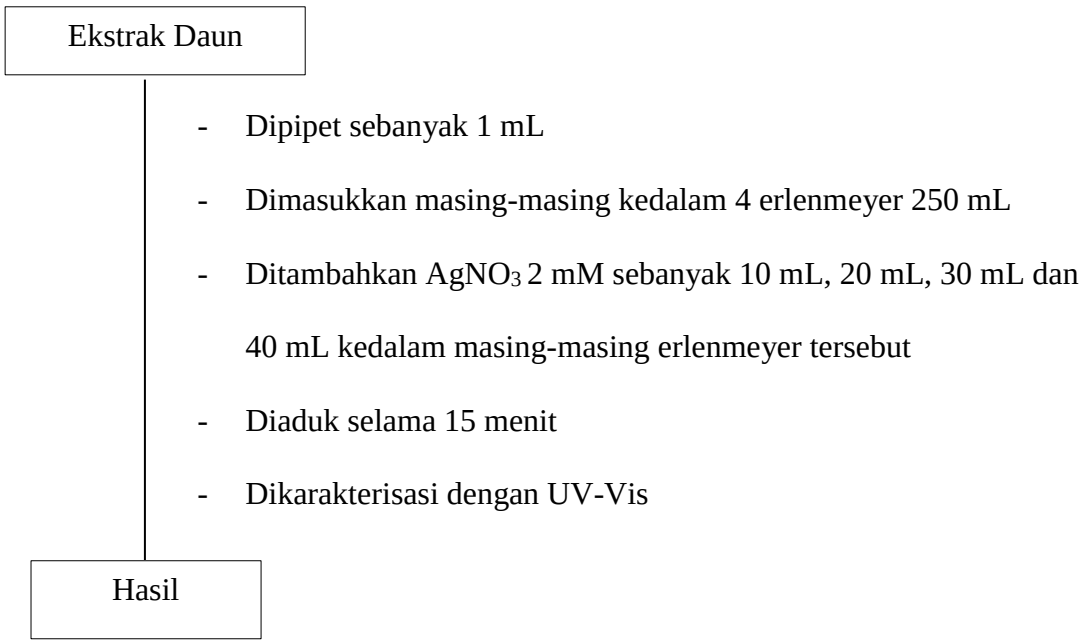
Lampiran 2. Optimasi Konsentrasi Larutan $AgNO_3$

Larutan $AgNO_3$ variasi konsentrasi 2 mM; 1,5 mM; 1 mM; dan 0,5 mM

- Dimasukkan kedalam masing-masing erlenmeyer 250 mL sebanyak 40 mL
- Ditambahkan sebanyak 1 mL ekstrak daun salam kedalam masing-masing erlenmeyer
- Diaduk selama 15 menit
- Dikarakterisasi dengan UV-Vis

Hasil

Lampiran 3. Optimasi Komposisi Larutan $AgNO_3$ 2 mM



Lampiran 4. Bagan Kerja Sintesis Nanopartikel Perak

Ekstrak Daun Salam

- Dipipet sebanyak 1 mL
- Dimasukkan kedalam erlenmeyer 250 mL
- Ditambahkan $AgNO_3$ 2 mM sebanyak 30 mL
- Diaduk selama 15 menit
- Diuji warna, pH dan spektrum UV-Vis pada hari 1, 2, 3, 4, 7, 8 dan 9
- Disentrifuge selama 30 menit pada suhu 27 °C
- Dikarakterisasi dengan *Particle Size Analyzer*
- *Difrezze dryer*
- Dikarakterisasi menggunakan FTIR, SEM dan XRD

Hasil

Lampiran 5. Bagan Kerja Uji Aktivitas Antioksidan

1. Pembuatan Larutan Induk Nanopartikel Perak 500 ppm

Serbuk Nanopartikel Perak

- Ditimbang sebanyak 0,005 g
- Dilarutkan dengan metanol sebanyak 10 mL

Hasil

2. Pembuatan Larutan Induk Ekstrak Daun Salam 500 ppm

Ekstrak Daun Salam
Konsentrasi 50.000 ppm

- Dipipet sebanyak 0,1 mL
- Ditambahkan dengan metanol sebanyak 10 mL

Hasil

3. Penentuan Aktivitas Antioksidan dengan Metode DPPH

Larutan Induk 500 ppm

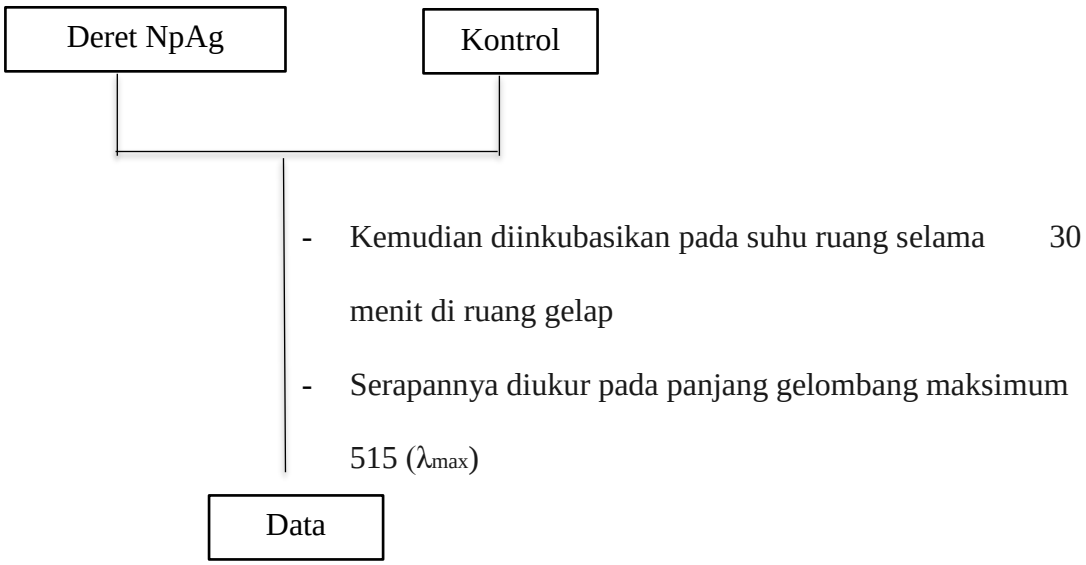
- Dipipet sebanyak 0,1 mL; 0,2 mL; 0,4 mL; 0,8 mL dan 1,6 mL (variasi konsentrasi 10 ppm; 20 ppm; 40 ppm; 80 ppm dan 160 ppm)
- Dimasukkan kedalam tabung reaksi
- Ditambahkan 1 mL larutan DPPH 0,4 mM
- Volume dicukupkan sampai 5 mL dengan menggunakan metanol.

Deret NpAg

Larutan DPPH

- Dipipet sebanyak 1 mL
- Volume dicukupkan sampai 5 mL dengan menggunakan metanol.

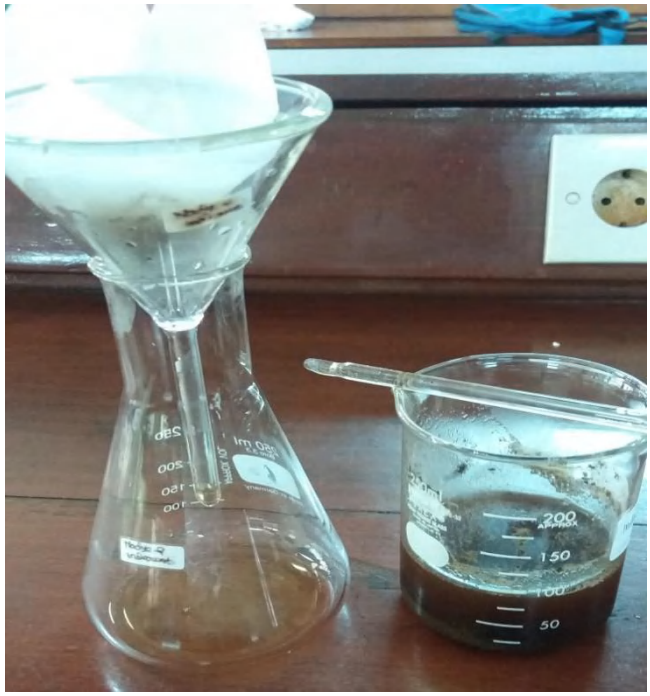
Kontrol



Catatan: Larutan blanko yang digunakan 5 mL metanol dan perlakuan yang sama dilakukan terhadap asam askorbat sebagai kontrol positif dan ekstrak daun salam.

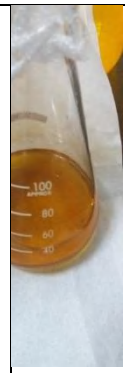
Lampiran 6. Foto Penelitian

Serbuk Daun Salam



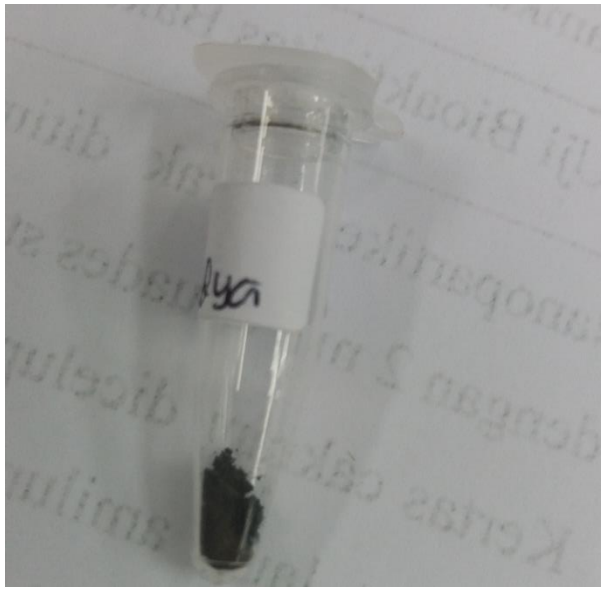
Penyaringan Ekstrak

Ekstrak Daun Salam

					
Sebelum pengadukan	Setelah pengadukan	1 hari	2 hari	3 hari	6 hari

Dokumentasi Proses Terbentuknya Nanopartikel Perak

Nanopartikel perak dengan perbandingan konsentrasi larutan $AgNO_3$ dan ekstrak daun salam.



Serbuk Nanopartikel Perak

Lampiran 7. Perhitungan

A. Pembuatan Larutan Nanopartikel $AgNO_3$ 2 Mm

Massa $AgNO_3$ = V × M × Mr

$$= \frac{250\ mL}{1000} \times 0.002\ M \times 170\ gr/mol$$

$$= 0.0850\ gr$$

B. Optimasi Komposisi Larutan $AgNO_3$

1.) Perbandingan ekstrak daun salam : $AgNO_3$ 1:10

$$\% = \frac{\text{Volume ekstrak daun salam}}{\text{Volume ekstrak daun salam} + \text{Volume } AgNO_3} \times 100\%$$

$$\% = \frac{1\ mL}{1\ mL + 10\ mL} \times 100\%$$

% = 9.09%

2.) Perbandingan ekstrak daun salam : $AgNO_3$ 1:20

$$\% = \frac{\text{Volume ekstrak daun salam}}{\text{Volume ekstrak daun salam} + \text{Volume } AgNO_3} \times 100\%$$

$$\% = \frac{1\ mL}{1\ mL + 20\ mL} \times 100\%$$

% = 4.76%

3.) Perbandingan ekstrak daun salam : $AgNO_3$ 1:30

$$\% = \frac{\text{Volume ekstrak daun salam}}{\text{Volume ekstrak daun salam} + \text{Volume } AgNO_3} \times 100\%$$

$$\% = \frac{1\ mL}{1\ mL + 30\ mL} \times 100\%$$

%

4.) Perbandingan ekstrak daun salam : $AgNO_3$ 1:40

$$\% = \frac{\text{Volume ekstrak daun salam}}{\text{Volume ekstrak daun salam+Volume } AgNO_3} \times 100\%$$

$$\% = \frac{1\ mL}{1\ mL+40\ mL} \times 100\%$$

% = 2.44%

C. Antioksidan

1. **Pembuatan larutan induk Nanopartikel Perak 500 ppm dalam 10 mL metanol**

$$ppm = \frac{mg}{L}$$

$$500 = \frac{mg}{0{,}01}$$

$$mg = 500 \times 0{,}01$$

$$= 5\ mg = 0{,}005\ gram$$

2. **Pembuatan larutan induk ekstrak Daun Salam 50.000 ppm dalam 100 mL akuabides**

$$ppm = \frac{mg}{L}$$

$$50{,}000 = \frac{mg}{0{,}1}$$

$$mg = 5.000\ mg = 5\ gram$$

3. **Pembuatan larutan induk ekstrak Daun Salam 500 ppm 10 mL metanol**

$$C_1 \times V_1 = C_2 \times V_2$$

$$50.000 \times V1 = 500 \times 10$$

$$V1 = \frac{5.000}{50.000}$$

$$V1 = 0{,}1\ mL$$

Volume metanol yang dibutuhkan = 10 mL - 0,1 mL = 9,9 mL

4. Perhitungan larutan deret standar nanopartikel perak dan ekstrak daun kluwak dari masing-masing 500 ppm

a. Pembuatan Larutan Konsentrasi 10 ppm

$$C_1 \times V_1 = C_2 \times V_2$$

$$500 \text{ ppm} \times V_1 = 10 \text{ ppm} \times 5 \text{ mL}$$

$$V_1 = \frac{10 \text{ ppm} \times 5 \text{ mL}}{500 \text{ ppm}}$$

$$V_1 = 0{,}1 \text{ mL}$$

Volume metanol yang dibutuhkan dalam 1 mL DPPH= 5 mL - (0,1 mL + 1 mL)= 3,9 mL

b. Pembuatan larutan konsentrassi 20 ppm

$$C_1 \times V_1 = C_2 \times V_2$$

$$500 \text{ ppm} \times V_1 = 20 \text{ ppm} \times 5 \text{ mL}$$

$$V_1 = \frac{20 \text{ ppm} \times 5 \text{ mL}}{500 \text{ ppm}}$$

$$V_1 = 0{,}2 \text{ mL}$$

Volume metanol yang dibutuhkan dalam 1 mL DPPH= 5 mL - (0,2 mL + 1 mL)= 3,8 mL

c. Pembuatan larutan konsentrasi 40 ppm

$$C_1 \times V_1 = C_2 \times V_2$$

$$500 \text{ ppm} \times V_1 = 40 \text{ ppm} \times 5 \text{ mL}$$

$$V_1 = \frac{40 \text{ ppm} \times 5 \text{ mL}}{500 \text{ ppm}}$$

$$V_1 = 0{,}4 \text{ mL}$$

Volume metanol yang dibutuhkan dalam 1 mL DPPH= 5 mL - (0,4 mL + 1 mL)= 3,6 mL

d. Pembuatan larutan konsentrasi 80 ppm

$C_1 \times V_1 = C_2 \times V_2$

$500 \text{ ppm} \times V_1 = 80 \text{ ppm} \times 5 \text{ mL}$

$$V_1 = \frac{80 \text{ ppm} \times 5 \text{ mL}}{500 \text{ ppm}}$$

$V_1 = 0{,}8 \text{ mL}$

Volume metanol yang dibutuhkan dalam 1 mL DPPH= 5 mL - (0,8 mL + 1 mL)= 3,2 mL

e. Pembuatan larutan konsentrasi 160 ppm

$C_1 \times V_1 = C_2 \times V_2$

$500 \text{ ppm} \times V_1 = 160 \text{ ppm} \times 5 \text{ mL}$

$$V_1 = \frac{160 \text{ ppm} \times 5 \text{ mL}}{500 \text{ ppm}}$$

$V_1 = 1{,}6 \text{ mL}$

Volume metanol yang dibutuhkan dalam 1 mL DPPH= 5 mL - (1,6 mL + 1 mL)= 2,4 mL

f. Pembuatan larutan konsentrasi 320 ppm

$C_1 \times V_1 = C_2 \times V_2$

$500 \text{ ppm} \times V_1 = 320 \text{ ppm} \times 5 \text{ mL}$

$$V_1 = \frac{320 \text{ ppm} \times 5 \text{ mL}}{500 \text{ ppm}}$$

$V_1 = 3{,}2 \text{ mL}$

Volume metanol yang dibutuhkan dalam 1 mL DPPH= 5 mL - (3,2 mL + 1 mL)= 0,8 mL

Lampiran 8. Persamaan *Scherrer*

$$Ds = \frac{K\lambda}{\beta \cos\theta}$$

$$Ds1 = \frac{(0,98)(1,54\ Å)}{(0,92180\ °)\cos(\frac{37,7626}{2})}$$

$$Ds1 = \frac{(0,98)(0,154\ nm)}{\left(\frac{3,14}{180}° (0,92180\ °)\right)\cos\ (18,8813\ °)}$$

$$Ds1 = \frac{0,15092\ nm}{(0,0161)(0,946191)}$$

$$Ds1 = \frac{0,15092\ nm}{0,015}$$

$$Ds1 = 10,06\ nm$$

$$Ds2 = \frac{(0,98)(1,54\ Å)}{(0,98670\ °)\cos(\frac{77,3133}{2})}$$

$$Ds2 = \frac{(0,98)(0,154\ nm)}{\left(\frac{3,14}{180}° (0,98670\ °)\right)\cos\ (38,65665\ °)}$$

$$Ds2 = \frac{0,15092\ nm}{(0,0172)(0,780903)}$$

$$Ds2 = \frac{0,15092\ nm}{0,013}$$

$$Ds2 = 11,61\ nm$$

$$Ds3 = \frac{(0{,}98)(1{,}54\ \text{Å})}{(0{,}73340\ °)\cos(\frac{64{,}3000}{2})}$$

$$Ds3 = \frac{(0{,}98)(0{,}154\ \text{nm})}{\left(\frac{3{,}14}{180}° (0{,}73340\ °)\right)\cos\ (32{,}1500\ °)}$$

$$Ds3 = \frac{0{,}15092\ \text{nm}}{(0{,}0128)(0{,}846658)}$$

$$Ds3 = \frac{0{,}15092\ \text{nm}}{0{,}0108}$$

$$Ds3 = 13{,}97\ \text{nm}$$

$$Ds4 = \frac{(0{,}98)(1{,}54\ \text{Å})}{(0{,}77110\ °)\cos(\frac{43{,}9855}{2})}$$

$$Ds4 = \frac{(0{,}98)(0{,}154\ \text{nm})}{\left(\frac{3{,}14}{180}° (0{,}77110\ °)\right)\cos\ (21{,}99275\ °)}$$

$$Ds4 = \frac{0{,}15092\ \text{nm}}{(0{,}0134)(0{,}927231)}$$

$$Ds4 = \frac{0{,}15092\ \text{nm}}{0{,}0124}$$

$$Ds4 = 12{,}17\ \text{nm}$$

Lampiran 9. Hasil Analisis Spektrofotometer UV-Vis

1. Tabel optimasi konsentrasi larutan $AgNO_3$

   a. Konsentrasi $AgNO_3$ 0,5 mM

Hari ke-	Panjang Gelombang (nm)	Absorban
1	455	1,949
2	458	2,243
3	457	2,448
6	456	2,743

   b. Konsentrasi $AgNO_3$ 1 mM

Hari ke-	Panjang Gelombang (nm)	Absorban
1	443	2,693
2	448	3,103
3	444	3,383
6	449	3,881

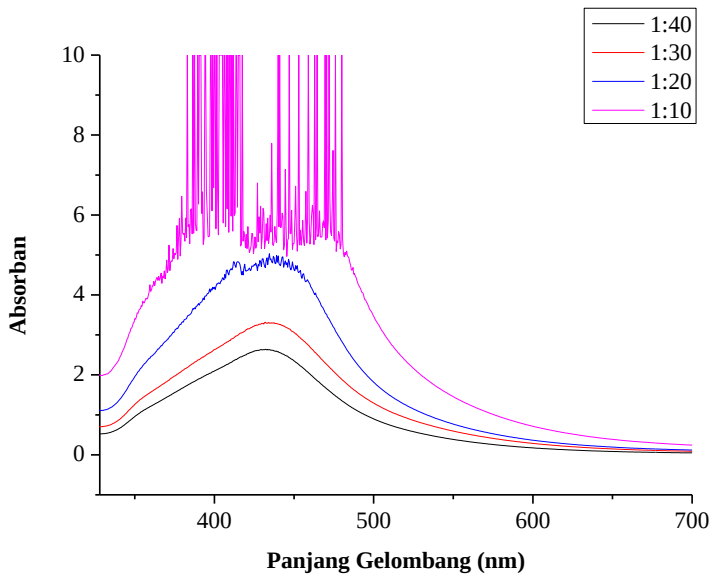
   c. Konsentrasi $AgNO_3$ 1,5 mM

Hari ke-	Panjang Gelombang (nm)	Absorban
1	441	3,366
2	445	3,880
3	442	4,254
6	451	4,797

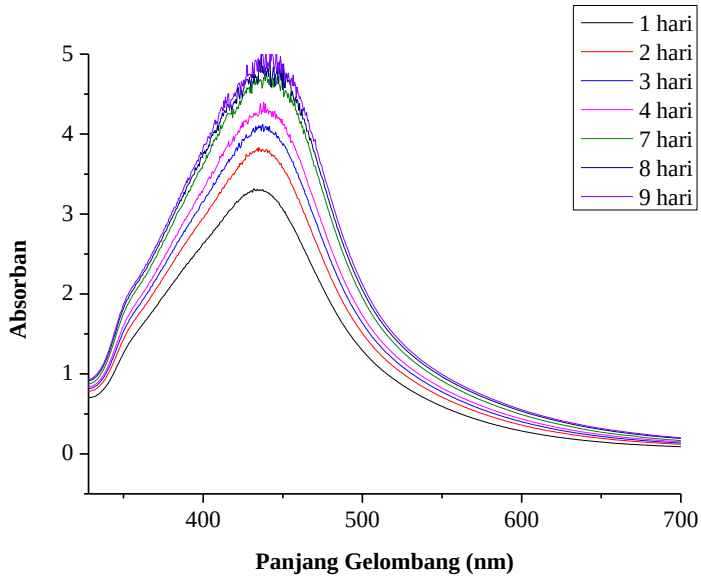
d. Konsentrasi $AgNO_3$ 2 mM

Hari ke-	Panjang Gelombang (nm)	Absorban
1	437	3,858
2	441	4,439
3	439	4,841
6	435	5,411

2. Spektrum serapan UV-Vis optimasi komposisi larutan $AgNO_3$



3. Spektrum serapan UV-Vis nanopartikel perak pada rentang panjang gelombang 200-700 nm.



Lampiran 10. Data Antioksidan

A. Ekstrak Daun Salam

1. Simplo

No	Konsentrasi (ppm)	Absorbansi (A) λ = 515 nm	Aktivitas Antioksidan (%)
1	10	0,328	5,75
2	20	0,32	8,05
3	40	0,274	21,26
4	80	0,21	39,66
5	160	0,102	70,69
6	Kontrol	0,348	

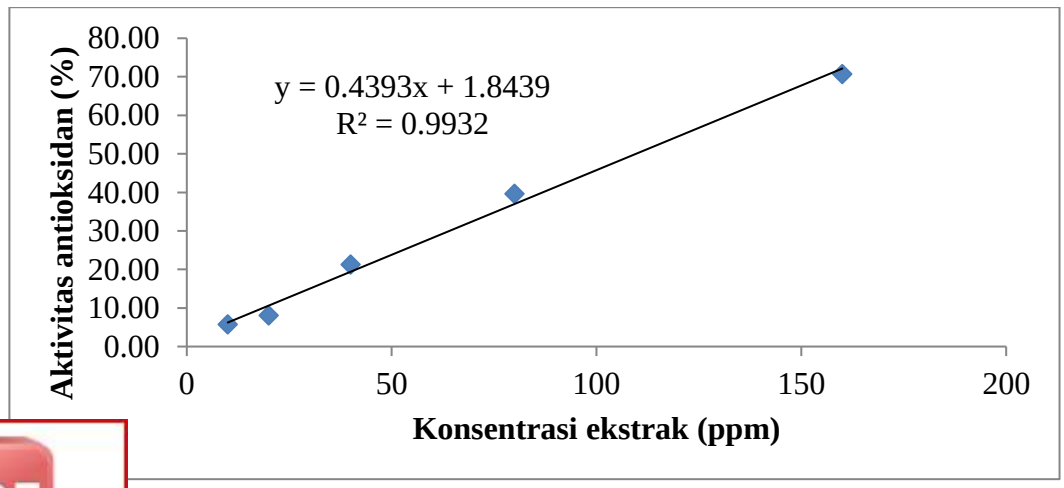
No	Konsentrasi (ppm)	Aktivitas Antioksidan (%)	Nilai IC-50 (ppm)
1	10	5,75	109,697
2	20	8,05	
3	40	21,26	
4	80	39,66	
5	160	70,69	

nilai IC50

x = IC 50 y=50

y = 0.439x + 1.843

IC_{50} (X) = (y-1.843)/0.439 = (50-1.843)/0.439 = 109.697 ppm



2. Duplo

No	Konsentrasi (ppm)	Absorbansi (A) λ = 515 nm	Aktivitas Antioksidan (%)
1	10	0,328	5,75
2	20	0,32	8,05
3	40	0,274	21,26
4	80	0,21	39,66
5	160	0,101	70,98
6	Kontrol	0,348	

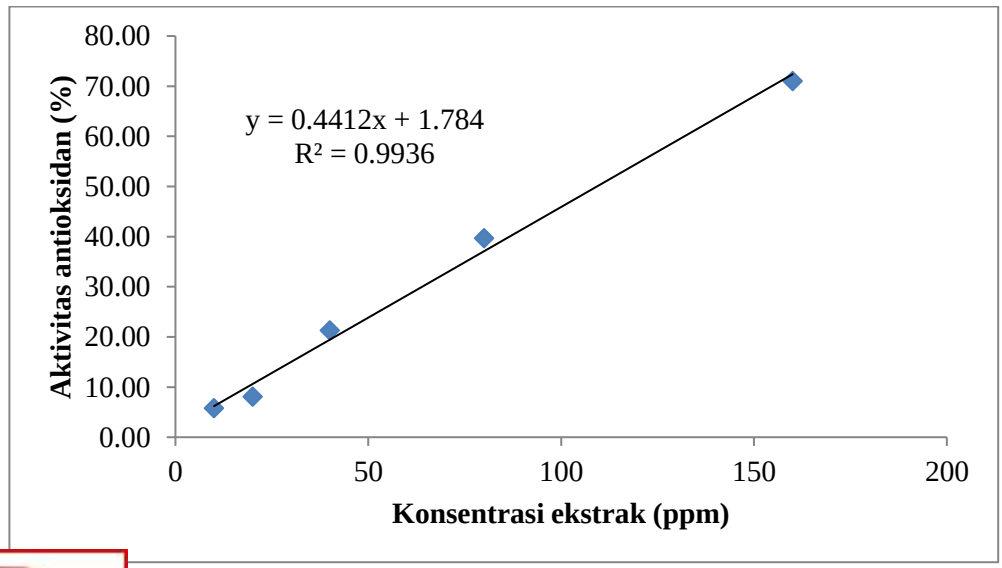
No	Konsentrasi (ppm)	Aktivitas Antioksidan (%)	Nilai IC-50 (ppm)
1	10	5,75	109,333
2	20	8,05	
3	40	21,26	
4	80	39,66	
5	160	70,98	

Nilai IC

x = IC_{50} y = 50

y = 0.441x + 1.784

IC_{50} (X) = (y-1.784)/0.441= (50-1.784)/0.441 = 109.333



3. Triplo

No	Konsentrasi (ppm)	Absorbansi (A) λ = 515 nm	Aktivitas Antioksidan (%)
1	10	0,328	5,75
2	20	0,321	7,76
3	40	0,275	20,98
4	80	0,21	39,66
5	160	0,102	70,69
6	Kontrol	0,348	

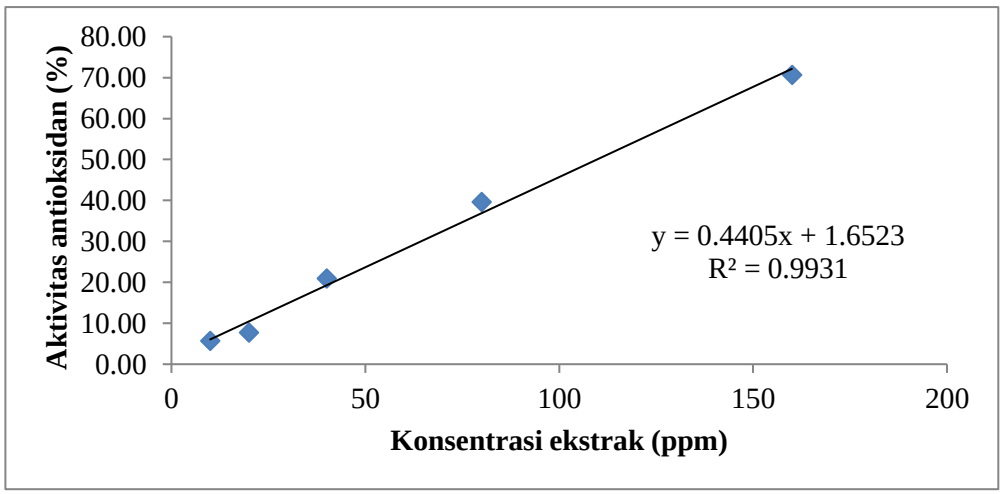
No	Konsentrasi (ppm)	Aktivitas Antioksidan (%)	Nilai IC-50 (ppm)
1	10	5,75	109,882
2	20	7,76	
3	40	20,98	
4	80	39,66	
5	160	70,69	

nilai IC_{50}

x = IC_{50} y = 50

y = 0.440x + 1.652

IC_{50} (X) = (y-1.652/0.440= (50-1.652)/0.440 = 109.882 ppm



B. Nanopartikel Perak

1. Simplo

No	Konsentrasi (ppm)	Absorbansi (A) λ = 515 nm	Aktivitas Antioksidan (%)
1	10	0,357	4,55
2	20	0,354	5,35
3	40	0,348	6,95
4	80	0,336	10,16
5	160	0,312	16,58
6	kontrol	0,374	

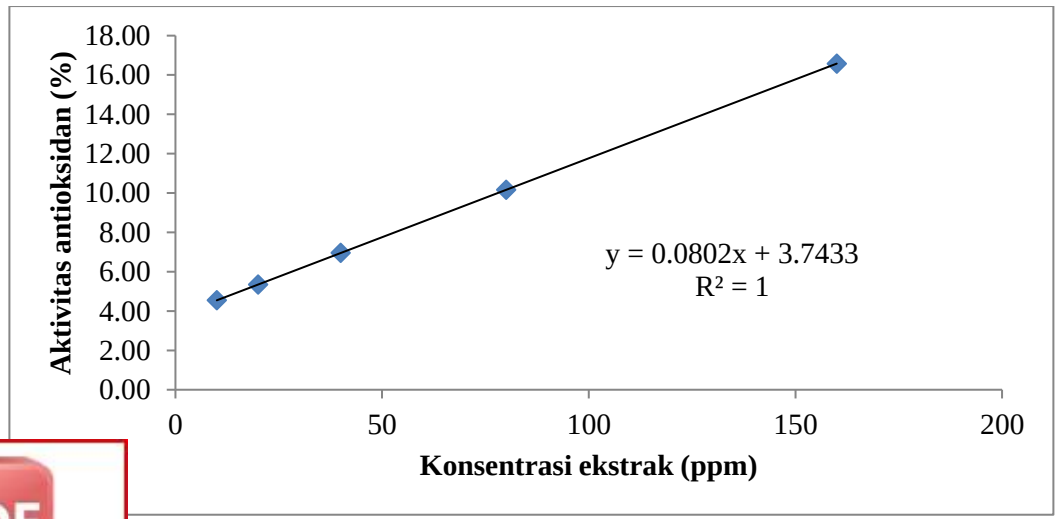
No	Konsentrasi (ppm)	Aktivitas Antioksidan (%)	Nilai IC-50 (ppm)
1	10	4,55	578,325
2	20	5,35	
3	40	6,95	
4	80	10,16	
5	160	16,58	

nilai IC_{50}

x = IC_{50} y = 50

y = 0.080x + 3.743

IC_{50} (X) = (y-3.743)/0.080 = (50-3.743)/0.080 = 578.325 ppm



2. Duplo

No	Konsentrasi (ppm)	Absorbansi (A) λ = 515 nm	Aktivitas Antioksidan (%)
1	10	0,357	4,55
2	20	0,354	5,35
3	40	0,348	6,95
4	80	0,336	10,16
5	160	0,312	16,58
6	Kontrol	0,374	

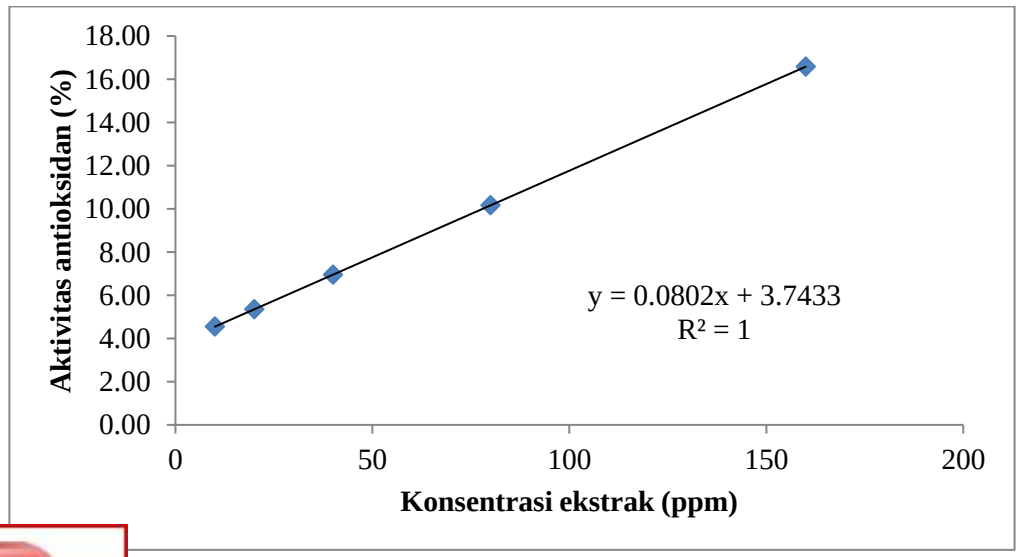
No	Konsentrasi (ppm)	Aktivitas Antioksidan (%)	Nilai IC-50 (ppm)
1	10	4,55	578,325
2	20	5,35	
3	40	6,95	
4	80	10,16	
5	160	16,58	

nilai I(

x = IC y = 50

y = 0.028x + 3.846

IC_{50} (X) = (y-3.846)/0.028= (50-3.846)/0.028 = 1648.357 ppm



3. Triplo

No	Konsentrasi (ppm)	Absorbansi (A) λ = 515 nm	Aktivitas Antioksidan (%)
1	10	0,356	4,81
2	20	0,353	5,61
3	40	0,349	6,68
4	80	0,336	10,16
5	160	0,312	16,58
6	Kontrol	0,374	

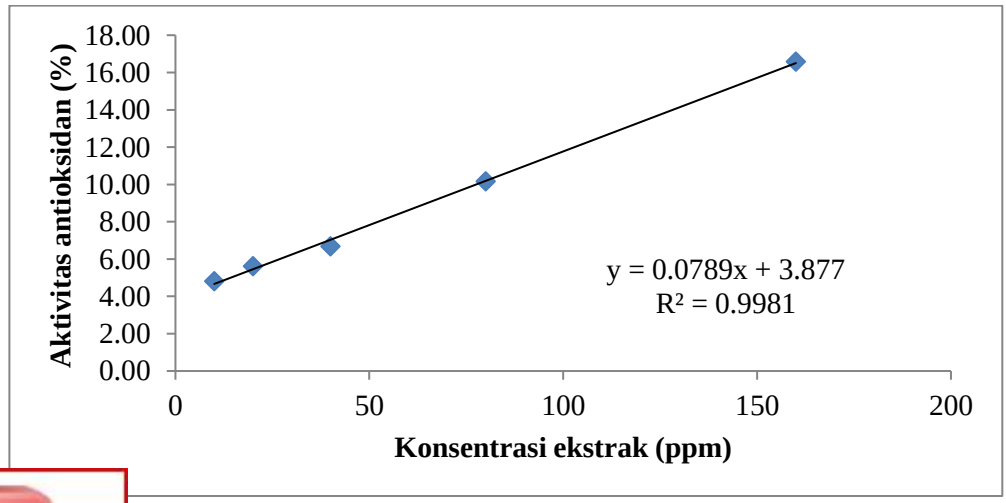
No	Konsentrasi (ppm)	Aktivitas Antioksidan (%)	Nilai IC-50 (ppm)
1	10	4,81	591,321
2	20	5,61	
3	40	6,68	
4	80	10,16	
5	160	16,58	

nilai IC_{50}

x = IC_{50} y = 50

y = 0.078x + 3.877

IC_{50} (X) = (y-3.877/0.078= (50-3.877)/0.078 = 591.321 ppm



C. Vitamin C

1. SIMPLO

No	Konsentrasi (ppm)	Absorbansi (A) λ = 515 nm	Aktivitas Antioksidan (%)
1	0,25	0,105	35,19
2	0,5	0,101	37,65
3	1	0,093	42,59
4	2	0,076	53,09
5	4	0,042	74,07
6	kontrol	0,162	

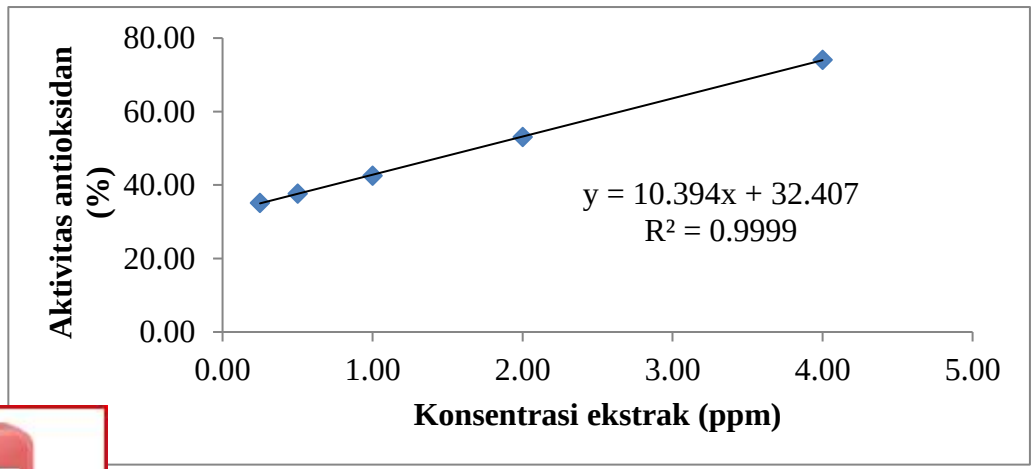
No	Konsentrasi (ppm)	Aktivitas Antioksidan (%)	Nilai IC-50 (ppm)
1	0,25	35,19	1,694
2	0,5	37,65	
3	1	42,59	
4	2	53,09	
5	4	74,07	

nilai IC_{50}

x = IC 50 y = 50

y = 10.39x + 32.40

IC50 (X) = (y-32.40)/ 10.39= (50 - 32.40)/ 10.39 = 1.694 ppm



2. DUPLC

No	Konsentrasi (ppm)	Absorbansi (A) λ = 515 nm	Aktivitas Antioksidan (%)
1	0,25	0,106	34,57
2	0,5	0,102	37,04
3	1	0,094	41,98
4	2	0,077	52,47
5	4	0,045	72,22
6	Kontrol	0,162	

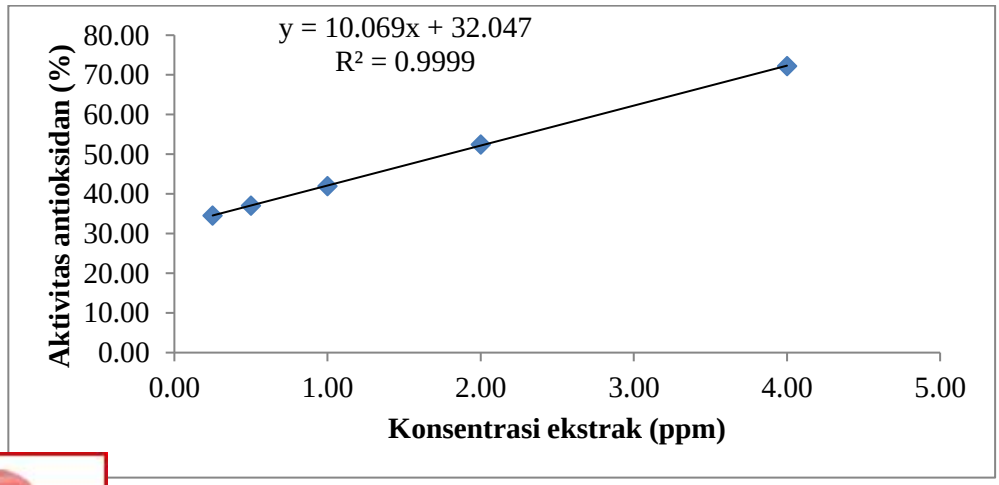
No	Konsentrasi (ppm)	Aktivitas Antioksidan (%)	Nilai IC-50 (ppm)
1	0,25	34,57	1,785
2	0,5	37,04	
3	1	41,98	
4	2	52,47	
5	4	72,22	

nilai IC_{50}

x = IC 50 y = 50

y = 10.06x + 32.04

IC50 (X) = (y-32.04)/10.06= (50 - 32.04)/10.06= 1.785 ppm



3. TRIPL(

No	Konsentrasi (ppm)	Absorbansi (A) λ = 515 nm	Aktivitas Antioksidan (%)
1	0,25	0,105	35,19
2	0,5	0,100	38,27
3	1	0,095	41,36
4	2	0,077	52,47
5	4	0,041	74,69
6	Kontrol	0,162	

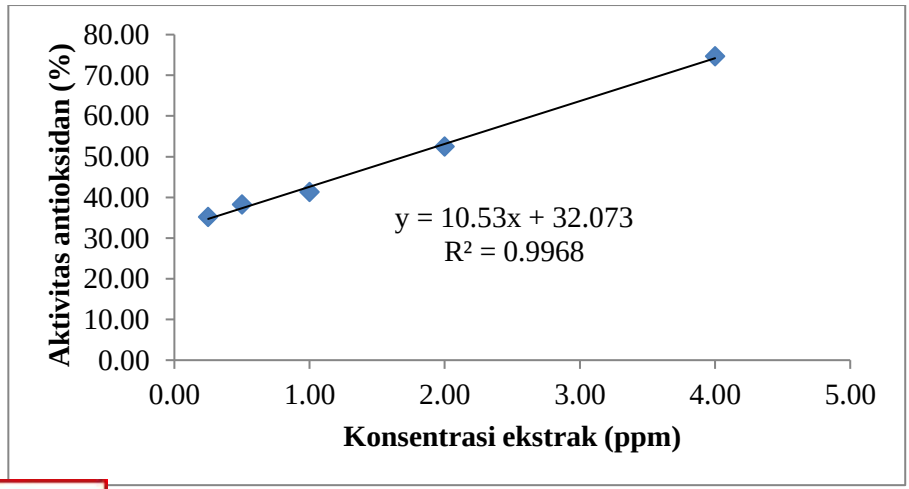
No	Konsentrasi (ppm)	Aktivitas Antioksidan (%)	Nilai IC-50 (ppm)
1	0,25	35,19	1,703
2	0,5	38,27	
3	1	41,36	
4	2	52,47	
5	4	74,69	

nilai IC_{50}

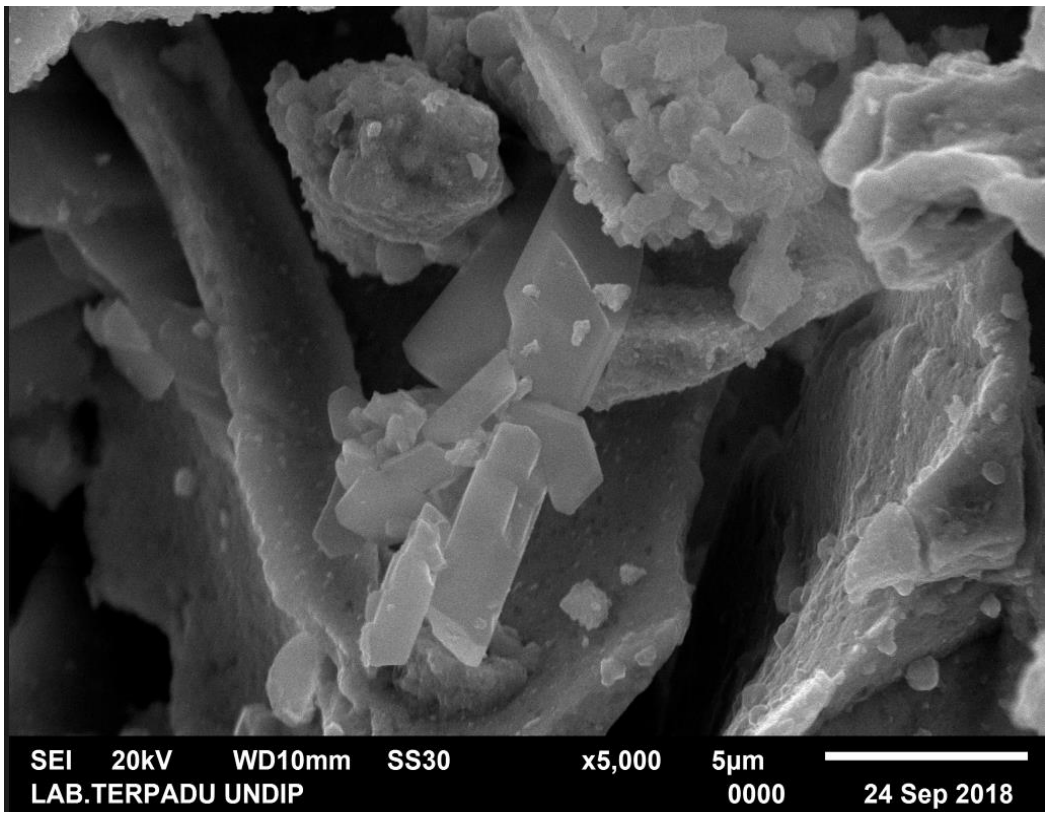
x = IC 50 y = 50

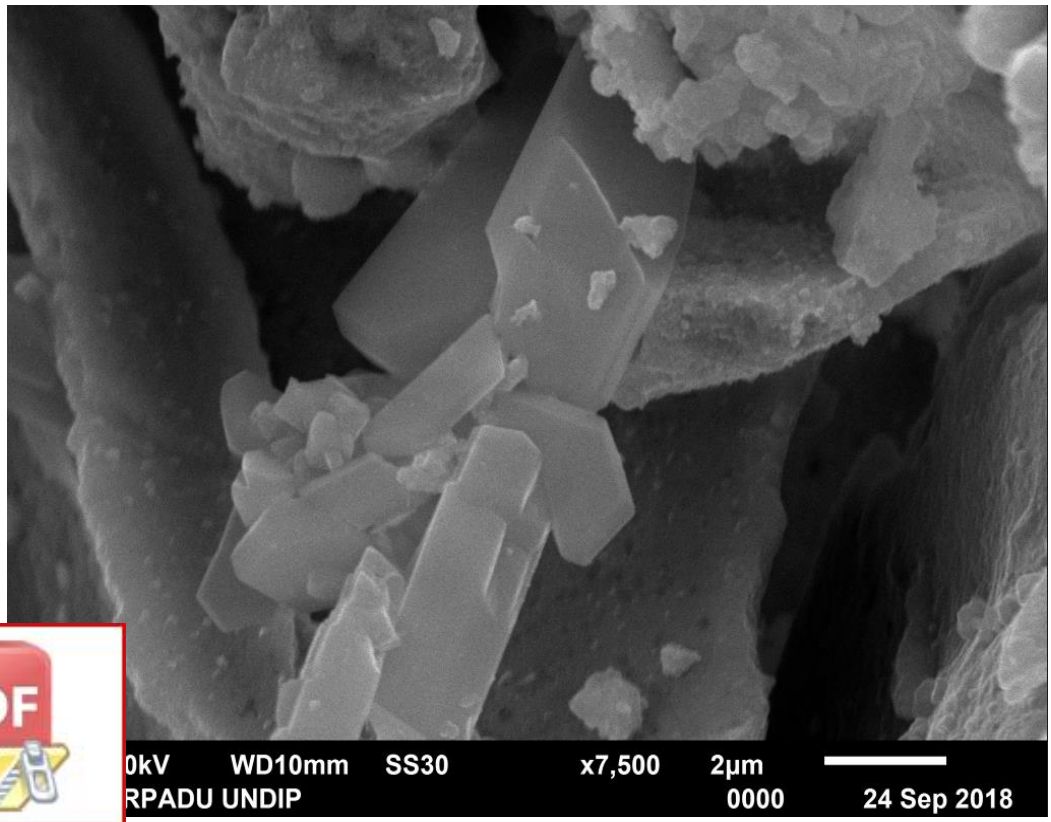
y = 10.53x + 32.07

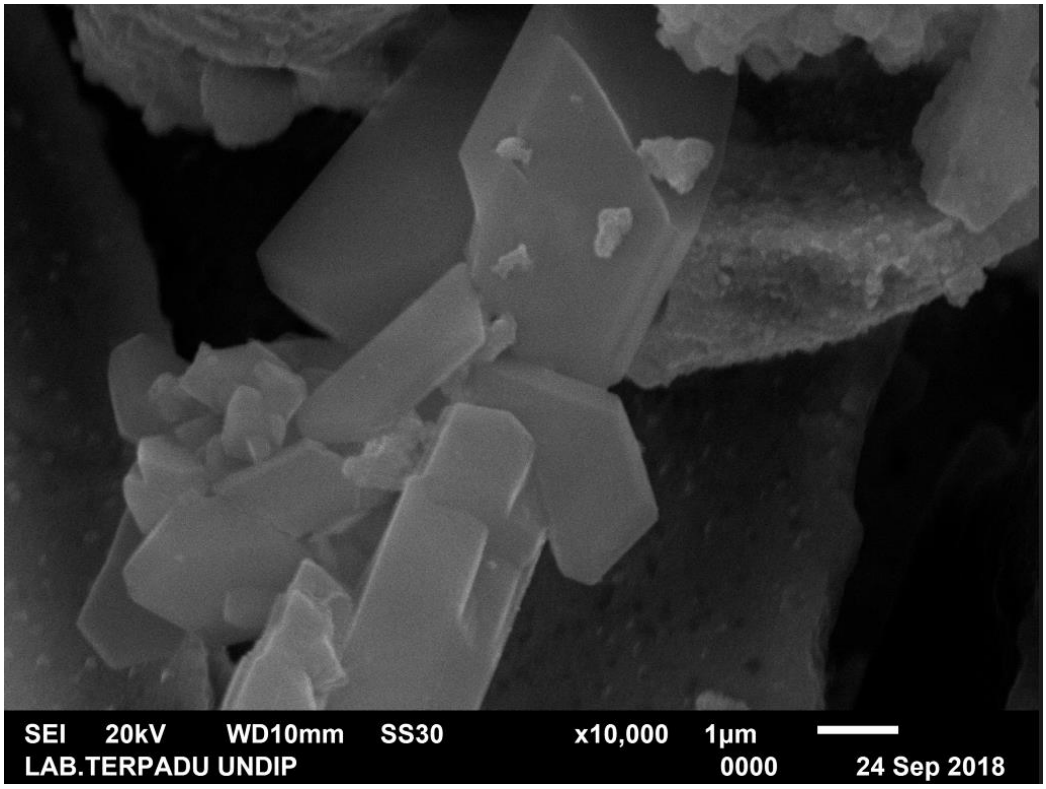
IC50 (X) = (y-32.07/10.53= (50 - 32.07)/10.53= 1.703 ppm

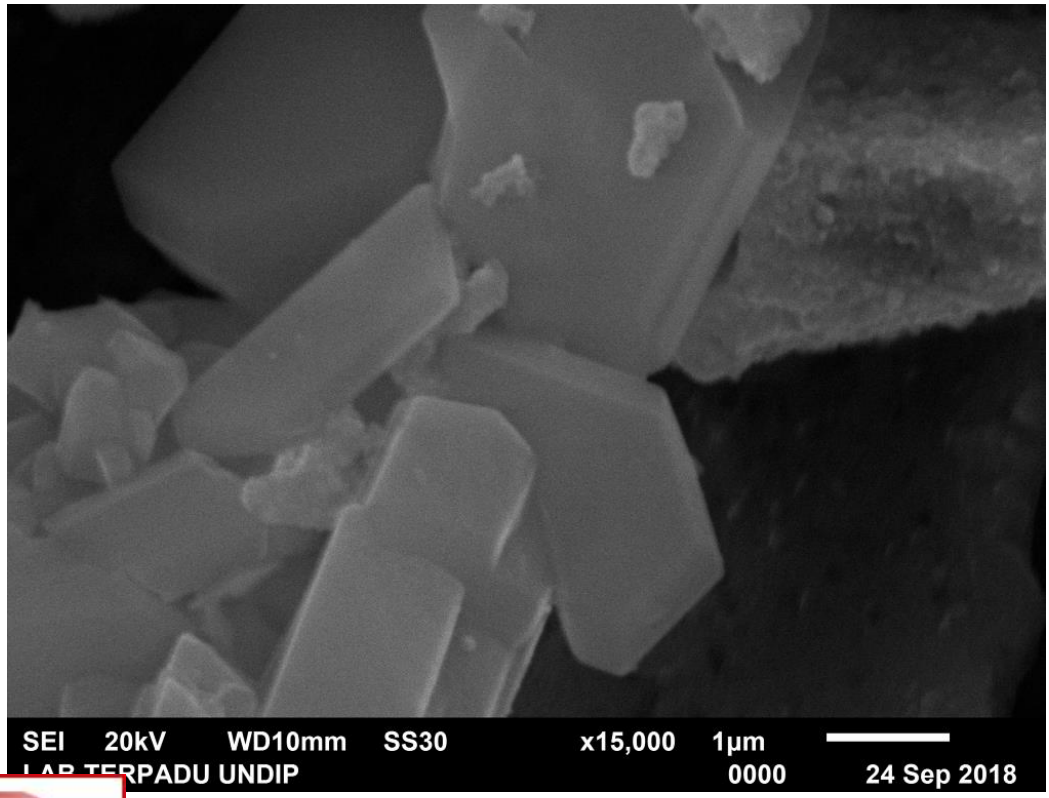


Lampiran 11. Hasil SEM









Lampiran 12. Hasil Analisis *Particle Size Analyzer*

Delsa™ Nano
Common

BECKMAN COULTER

Condition Summary S/N : 123909

User	: Common	Group	:
Date	: 9/13/2018	File Name	: NP - Ag 1_20180913_140940
Time	: 14:09:40	Sample Information	:
SOP Name	: Sampel Uji PSA		

Repetition : 1/1
Security : No Security

Version 2.31 / 2.03

Measurement Condition

Sampling Time	: N/A	(μs)			
Correlation Channel	: 440	(ch)	Correlation Method	: TD	
Accumulation times	: 30	(times)	Attenuator 1	: 65.58	(%)
Cell Center	: Z : 3.000 X : 7.500	(mm) (mm)	Pinhole	: 50	(μm)
Scattering Angle	: 165.0	(°)	Temperature	: 25.0	(°C)
Diluent Name	: WATER				
Refractive Index	: 1.3328		Viscosity	: 0.8878	(cP)
Intensity	: 7909	(cps)			

Cumulants Results

Mean Diameter	(d) : 45.7	(nm)	Diffusion Constant	(D) : 1.077e-007	(cm²/sec)
Polydispersity Index	(P.I.) : 0.280		Decay Constant	(Γ) : 6816.1	(1/sec)

Fitting Parameter

Analysis Method	: CONTIN				
Histogram Range	: 10.0 - 4000.0	(nm)	Cut	Left : 0	Right : 0
Fitting Range	: 1.003 - 2				
Noise Cut Level	: 0.3	(%)			
Residual	: 9.042e-003 [OK]				

BECKMAN COULTER

Cumulative Size Distribution Table S/N : 123909

User	: Common	Group	:	Repetition	: 1/1
Date	: 9/13/2018	File Name	: NP - Ag 1_20180913_140940		
Time	: 14:09:40	Sample Information	:		
SOP Name	: Sampel Uji PSA			Security	: No Security

Version 2.31 / 2.03

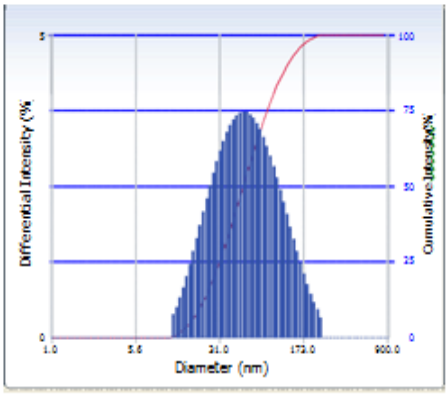
Cum.%	d (nm) Int. Dist.	d (nm) Vol. Dist.	d (nm) No. Dist.
5	17.0	11.7	11.3
10	20.9	12.3	11.5
15	24.3	12.9	11.7
20	27.6	13.6	11.9
25	30.9	14.2	12.2
30	34.3	14.9	12.5
35	37.9	15.6	12.7
40	41.7	16.3	13.0
45	45.7	17.2	13.3
50	50.2	18.1	13.7
55	55.0	19.0	14.1
60	60.4	20.2	14.5
65	66.5	21.5	15.0
70	73.6	23.0	15.6
75	82.0	24.8	16.3
80	92.2	27.1	17.2
85	105.3	30.2	18.3
90	123.4	34.8	20.0
95	153.0	43.5	23.1
100	243.9	243.9	173.0

Intensity Distribution S/N : 123909

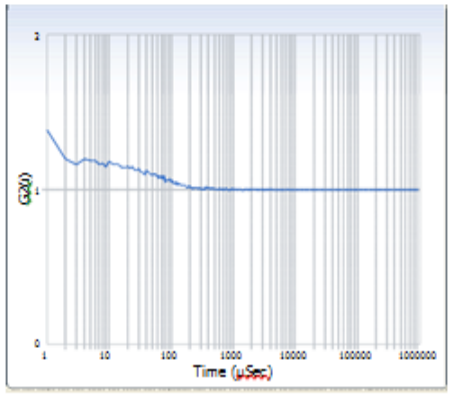
User	: Common	Group	:	Repetition : 1/1
Date	: 9/13/2018	File Name	: NP - Ag 1_20180913_140940	
Time	: 14:09:40	Sample Information :		
SOP Name : Sampel Uji PSA			Security	: No Security

Version 2.31 / 2.03

Intensity Distribution



ACF



Distribution Results (Contin)

Peak	Diameter (nm)	Std. Dev.
1	64.8	44.5
2	0.0	0.0
3	0.0	0.0
4	0.0	0.0
5	0.0	0.0
Average	64.8	44.5

Residual : 9.042e-003 (O.K)

Cumulants Results

Diameter	(d)	: 45.7	(nm)
Polydispersity Index	(P.I.)	: 0.280	
Diffusion Const.	(D)	: 1.077e-007	(cm²/sec)

Measurement Condition

Temperature	: 25.0	(°C)
Diluent Name	: WATER	
Refractive Index	: 1.3328	
Viscosity	: 0.8878	(cP)
Scattering Intensity	: 7909	(cps)

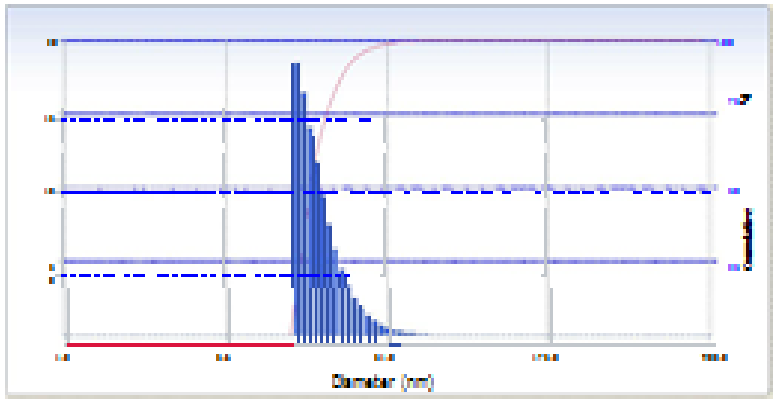
Delsa™ Nano
Common

Number Distribution S/N : 123929

User	: Common	Group	:	Repetition	: 1/1
Date	: 9/13/2018	File Name	: NP - Ag 1_20180913_140940		
Time	: 14:09:40	Sample Information	:		
SOP Name	: Sampel Uji PSA			Security	: No Security

Version 2.31 / 2.03

Number Distribution



Distribution Results (Conc)

Peak	Diameter (nm)	Std. Dev.
1	15.5	4.4
2	0.0	0.0
3	0.0	0.0
4	0.0	0.0
5	0.0	0.0
Average	15.5	4.4

Residual : 9.042e-003 (0.K)

Cumulants Results

Diameter	(d)	: 45.7	(nm)
Polydispersity Index	(P.I.)	: 0.280	
Diffusion Const.	(D)	: 1.077e-007	(cm²/sec)

Measurement Condition

Temperature	: 25.0	(°C)
Diluent Name	: WATER	
Refractive Index	: 1.3328	
Viscosity	: 0.8878	(cP)
Scattering Intensity	: 7909	(cps)

Number Distribution Table

d (nm)	f(%)	f(cum.%)	d (nm)	f(%)	f(cum.%)	d (nm)	f(%)	f(cum.%)	d (nm)	f(%)	f(cum.%)
1.0	0.0	0.0	5.8	0.0	0.0	31.0	0.9	99.0	173.0	0.0	100.0
1.1	0.0	0.0	6.0	0.0	0.0	33.3	0.5	99.5	185.3	0.0	100.0
1.1	0.0	0.0	6.4	0.0	0.0	35.8	0.2	99.8	198.8	0.0	100.0
1.2	0.0	0.0	6.8	0.0	0.0	38.2	0.2	99.7	212.8	0.0	100.0
1.3	0.0	0.0	7.3	0.0	0.0	40.9	0.1	99.8	227.7	0.0	100.0
1.4	0.0	0.0	7.9	0.0	0.0	43.8	0.1	99.9	243.9	0.0	100.0
1.5	0.0	0.0	8.4	0.0	0.0	46.9	0.0	99.9	261.3	0.0	100.0
1.6	0.0	0.0	9.0	0.0	0.0	50.2	0.0	99.9	279.9	0.0	100.0
1.7	0.0	0.0	9.7	0.0	0.0	53.8	0.0	100.0	299.8	0.0	100.0
1.9	0.0	0.0	10.3	0.0	0.0	57.6	0.0	100.0	321.1	0.0	100.0
2.0	0.0	0.0	11.1	0.0	0.0	61.7	0.0	100.0	343.9	0.0	100.0
2.1	0.0	0.0	11.9	18.5	18.5	66.1	0.0	100.0	368.4	0.0	100.0
2.3	0.0	0.0	12.7	16.5	34.9	70.8	0.0	100.0	394.6	0.0	100.0
2.4	0.0	0.0	13.6	14.1	49.0	75.9	0.0	100.0	422.7	0.0	100.0
2.6	0.0	0.0	14.6	11.7	60.7	81.2	0.0	100.0	452.7	0.0	100.0
2.8	0.0	0.0	15.6	9.5	70.2	87.0	0.0	100.0	484.9	0.0	100.0
0	0.0	0.0	16.7	7.5	77.7	93.2	0.0	100.0	519.4	0.0	100.0
2	0.0	0.0	17.9	5.8	83.5	99.8	0.0	100.0	556.4	0.0	100.0
4	0.0	0.0	19.2	4.4	88.0	106.9	0.0	100.0	595.9	0.0	100.0
7	0.0	0.0	20.6	3.3	91.3	114.6	0.0	100.0	638.3	0.0	100.0

9%) :	11.5 (nm)	D (50%) :	15.7 (nm)	D (90%) :	20 (nm)

Number Distribution Table

d (nm)	f(%)	f(cum.%)	d (nm)	f(%)	f(cum.%)	d (nm)	f(%)	f(cum.%)	d (nm)	f(%)	f(cum.%)
4.0	0.0	0.0	22.0	2.5	93.8	122.7	0.0	100.0	683.7	0.0	100.0
4.2	0.0	0.0	23.6	1.8	95.6	131.4	0.0	100.0	732.4	0.0	100.0
4.5	0.0	0.0	25.3	1.3	96.9	140.8	0.0	100.0	784.4	0.0	100.0
4.9	0.0	0.0	27.1	0.9	97.9	150.8	0.0	100.0	840.2	0.0	100.0
5.2	0.0	0.0	29.0	0.7	98.5	161.5	0.0	100.0	900.0	0.0	100.0

D (10%) :	11.5	(nm)	D (50%) :	15.7	(nm)	D (90%) :	20	(nm)

Size Distribution Table S/N : 123909

User	: Common	Group	:	Repetition	: 1/1
Date	: 9/13/2018	File Name	: NP - Ag 1_20180913_140940		
Time	: 14:09:40	Sample Information	:		
SOP Name	: Sampel Uji PSA			Security	: No Security

Version 2.31 / 2.03

r (1/sec)	d(nm)	f(%)Int.	f(cum.%)Int.	f(%)Vol.	f(cum.%)Vol.	f(%)No.	f(cum.%)No.
511407.3	1.0	0.0	0.0	0.0	0.0	0.000	0.00
290728.7	1.1	0.0	0.0	0.0	0.0	0.000	0.00
271425.3	1.1	0.0	0.0	0.0	0.0	0.000	0.00
253599.8	1.2	0.0	0.0	0.0	0.0	0.000	0.00
236873.1	1.3	0.0	0.0	0.0	0.0	0.000	0.00
220883.8	1.4	0.0	0.0	0.0	0.0	0.000	0.00
206197.7	1.5	0.0	0.0	0.0	0.0	0.000	0.00
192505.4	1.6	0.0	0.0	0.0	0.0	0.000	0.00
179722.4	1.7	0.0	0.0	0.0	0.0	0.000	0.00
167788.1	1.9	0.0	0.0	0.0	0.0	0.000	0.00
156648.4	2.0	0.0	0.0	0.0	0.0	0.000	0.00
146244.5	2.1	0.0	0.0	0.0	0.0	0.000	0.00
136533.4	2.3	0.0	0.0	0.0	0.0	0.000	0.00
127467.0	2.4	0.0	0.0	0.0	0.0	0.000	0.00
119002.8	2.6	0.0	0.0	0.0	0.0	0.000	0.00
111100.6	2.8	0.0	0.0	0.0	0.0	0.000	0.00
103725.1	3.0	0.0	0.0	0.0	0.0	0.000	0.00
96833.5	3.2	0.0	0.0	0.0	0.0	0.000	0.00
90405.3	3.4	0.0	0.0	0.0	0.0	0.000	0.00
84402.0	3.7	0.0	0.0	0.0	0.0	0.000	0.00
78797.4	4.0	0.0	0.0	0.0	0.0	0.000	0.00
73565.0	4.2	0.0	0.0	0.0	0.0	0.000	0.00
68680.0	4.5	0.0	0.0	0.0	0.0	0.000	0.00
64118.4	4.9	0.0	0.0	0.0	0.0	0.000	0.00
59861.7	5.2	0.0	0.0	0.0	0.0	0.000	0.00
55886.6	5.6	0.0	0.0	0.0	0.0	0.000	0.00
52175.6	6.0	0.0	0.0	0.0	0.0	0.000	0.00
48710.9	6.4	0.0	0.0	0.0	0.0	0.000	0.00
45476.3	6.8	0.0	0.0	0.0	0.0	0.000	0.00
42456.5	7.3	0.0	0.0	0.0	0.0	0.000	0.00
39637.3	7.9	0.0	0.0	0.0	0.0	0.000	0.00
37005.2	8.4	0.0	0.0	0.0	0.0	0.000	0.00
34547.9	9.0	0.0	0.0	0.0	0.0	0.000	0.00
32253.8	9.7	0.0	0.0	0.0	0.0	0.000	0.00
30112.1	10.3	0.0	0.0	0.0	0.0	0.000	0.00
28112.5	11.1	0.0	0.0	0.0	0.0	0.000	0.00
26245.7	11.9	0.4	0.4	6.5	6.5	15.48	15.48
24502.9	12.7	0.5	0.9	6.9	13.2	18.48	34.95
22875.8	13.6	0.7	1.6	7.3	20.5	14.10	49.05
21356.8	14.6	0.8	2.4	7.4	27.9	11.71	60.74
19938.8	15.6	1.0	3.4	7.4	35.3	9.48	70.22
18614.8	16.7	1.2	4.6	7.2	42.5	7.50	77.72
17378.6	17.9	1.4	6.1	6.8	49.3	5.82	83.55
16224.8	19.2	1.6	7.7	6.4	55.7	4.44	87.99
15147.2	20.6	1.9	9.6	5.9	61.6	3.34	91.32
14141.4	22.0	2.1	11.8	5.4	67.0	2.47	93.80
13202.3	23.6	2.3	13.9	4.9	71.9	1.81	95.61

r (Ų/acc)	d(nm)	f(%)Int.	f(cum.%)Int.	f(%)Vol.	f(cum.%)Vol.	f(%)No.	f(cum.%)No.
12325.6	25.3	2.5	16.5	4.3	75.2	1.31	96.92
11507.2	27.1	2.7	19.2	3.8	80.0	0.94	97.85
10745.1	29.0	2.9	22.1	3.3	83.3	0.66	98.52
10029.7	31.0	3.1	25.2	2.9	86.2	0.47	98.98
9355.7	33.3	3.3	28.5	2.4	88.6	0.33	99.31
8741.9	35.6	3.4	31.8	2.1	90.7	0.22	99.53
8161.4	38.2	3.5	35.4	1.7	92.4	0.15	99.69
7619.5	40.9	3.6	39.0	1.5	93.9	0.10	99.79
7113.5	43.8	3.7	42.6	1.2	95.1	0.07	99.86
6641.1	46.9	3.7	46.3	1.0	96.1	0.05	99.91
6200.1	50.2	3.7	50.1	0.8	96.9	0.03	99.94
5788.4	53.8	3.7	53.8	0.7	97.6	0.02	99.96
5404.1	57.6	3.7	57.5	0.5	98.1	0.01	99.98
5046.2	61.7	3.6	61.1	0.4	98.5	0.01	99.98
4710.2	66.1	3.5	64.7	0.3	98.9	0.01	99.99
4397.4	70.8	3.4	68.1	0.3	99.1	0.00	99.99
4105.4	75.9	3.3	71.4	0.2	99.3	0.00	100.00
3832.8	81.2	3.2	74.6	0.2	99.5	0.00	100.00
3578.3	87.0	3.0	77.6	0.1	99.6	0.00	100.00
3340.7	93.2	2.8	80.5	0.1	99.7	0.00	100.00
3118.8	99.8	2.6	83.1	0.1	99.8	0.00	100.00
2911.7	106.9	2.5	85.6	0.1	99.9	0.00	100.00
2718.4	114.6	2.2	87.8	0.0	99.9	0.00	100.00
2537.9	122.7	2.0	89.8	0.0	99.9	0.00	100.00
2369.4	131.4	1.8	91.7	0.0	99.9	0.00	100.00
2212.0	140.8	1.6	93.3	0.0	100.0	0.00	100.00
2065.1	150.8	1.4	94.7	0.0	100.0	0.00	100.00
1928.0	161.5	1.2	96.0	0.0	100.0	0.00	100.00
1800.0	173.0	1.1	97.0	0.0	100.0	0.00	100.00
1680.4	185.3	0.9	97.9	0.0	100.0	0.00	100.00
1568.9	198.5	0.7	98.6	0.0	100.0	0.00	100.00
1464.7	212.6	0.6	99.2	0.0	100.0	0.00	100.00
1367.4	227.7	0.4	99.7	0.0	100.0	0.00	100.00
1276.6	243.9	0.3	100.0	0.0	100.0	0.00	100.00
1191.5	261.3	0.0	100.0	0.0	100.0	0.00	100.00
1112.7	279.9	0.0	100.0	0.0	100.0	0.00	100.00
1038.8	299.8	0.0	100.0	0.0	100.0	0.00	100.00
969.8	321.1	0.0	100.0	0.0	100.0	0.00	100.00
905.4	343.9	0.0	100.0	0.0	100.0	0.00	100.00
845.3	368.4	0.0	100.0	0.0	100.0	0.00	100.00
789.2	394.6	0.0	100.0	0.0	100.0	0.00	100.00
736.8	422.7	0.0	100.0	0.0	100.0	0.00	100.00
687.9	452.7	0.0	100.0	0.0	100.0	0.00	100.00
642.2	484.9	0.0	100.0	0.0	100.0	0.00	100.00
599.5	519.4	0.0	100.0	0.0	100.0	0.00	100.00
559.7	556.4	0.0	100.0	0.0	100.0	0.00	100.00
522.6	595.9	0.0	100.0	0.0	100.0	0.00	100.00
487.9	638.3	0.0	100.0	0.0	100.0	0.00	100.00
455.5	683.7	0.0	100.0	0.0	100.0	0.00	100.00
425.2	732.4	0.0	100.0	0.0	100.0	0.00	100.00
397.0	784.4	0.0	100.0	0.0	100.0	0.00	100.00
370.8	840.2	0.0	100.0	0.0	100.0	0.00	100.00
346.0	900.0	0.0	100.0	0.0	100.0	0.00	100.00

BECKMAN COULTER

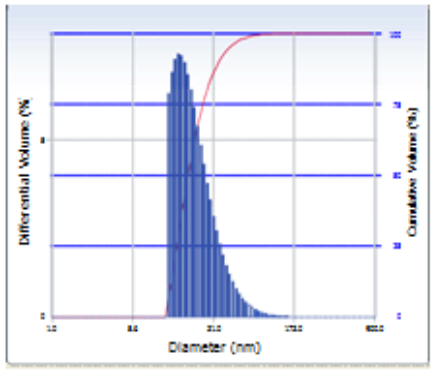
Delsa™ Nano
Common

Volume Distribution S/N : 123909

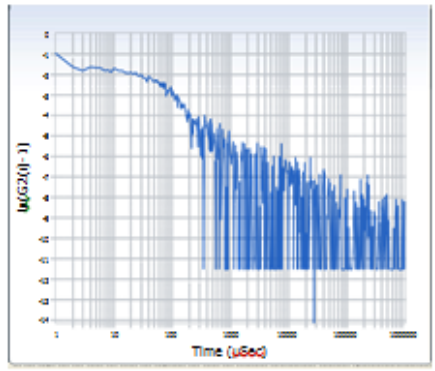
User	: Common	Group	:	Repetition : 1/1
Date	: 9/13/2018	File Name	: NP - Ag 1_20180913_140940	
Time	: 14:09:40	Sample Information :		
SOP Name : Sampel Uji PSA			Security	: No Security

Version 2.31 / 2.03

Volume Distribution



Ln(G2(τ)-1) vs τ



Distribution Results (Contin)

Peak	Diameter (nm)	Std. Dev.
1	22.4	12.3
2	0.0	0.0
3	0.0	0.0
4	0.0	0.0
5	0.0	0.0
Average	22.4	12.3

Residual : 9.042e-003 (O.K)

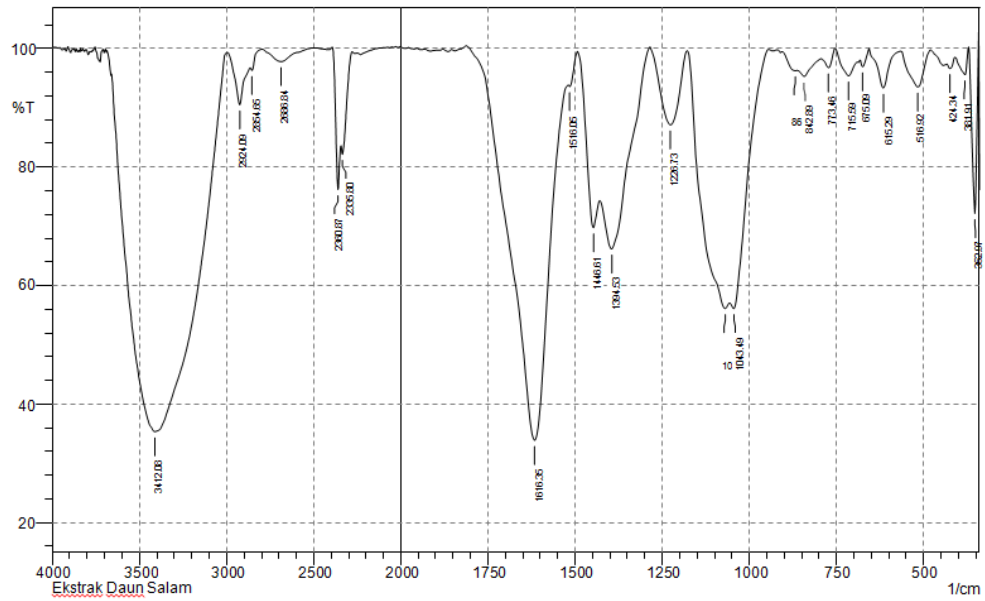
Cumulants Results

Diameter	(d)	: 45.7	(nm)
Polydispersity Index (P.I.)		: 0.280	
Diffusion Const.	(D)	: 1.077e-007	(cm²/sec)

Measurement Condition

Temperature	: 25.0	(°C)
Diluent Name	: WATER	
Refractive Index	: 1.3328	
Viscosity	: 0.8878	(cP)
Scattering Intensity	: 7909	(cps)

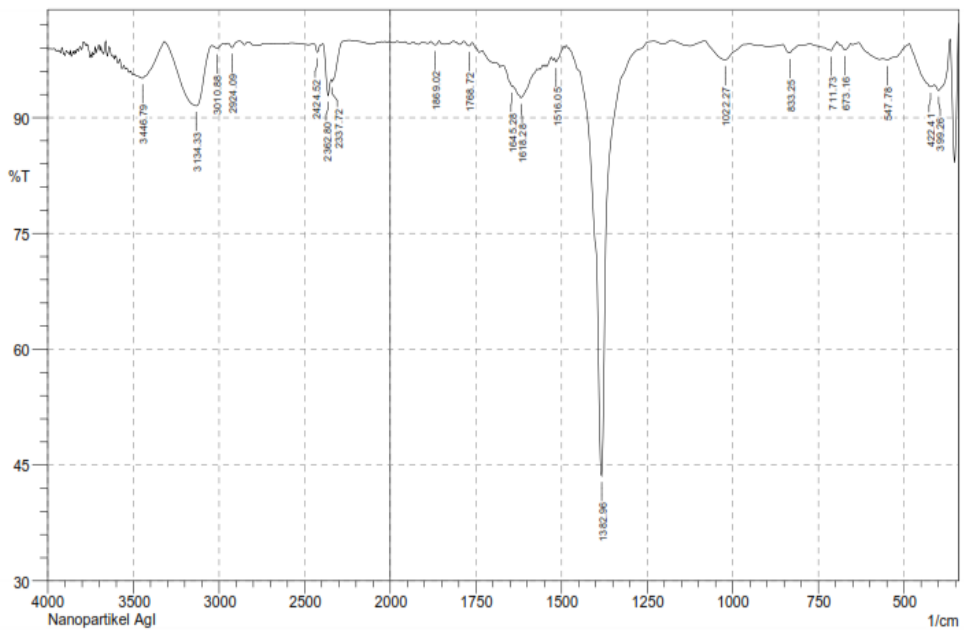
Lampiran 13. Hasil Analisis FTIR



	Peak	Intensity	Corr. Intensity	Base (H)	Base (L)	Area	Corr. Area
1	352.97	72.171	26.385	370.33	343.33	2.003	1.865
2	381.91	95.581	4.141	408.91	370.33	0.485	0.379
3	424.34	96.627	1.123	432.05	408.91	0.279	0.07
4	516.92	93.517	6.151	567.07	480.28	1.4	1.268
5	615.29	93.339	6.452	655.8	567.07	1.109	1.019
6	675.09	96.932	1.673	682.8	655.8	0.232	0.117
7	715.59	95.404	3.204	754.17	690.52	0.844	0.514
8	773.46	96.738	2.416	792.74	754.17	0.357	0.214
9	842.89	95.294	1.569	862.18	794.67	0.999	0.2
10	867.97	96.267	0.446	906.54	862.18	0.494	0.081
11	1043.49	56.132	5.432	1055.06	945.12	12.059	0.769
12	1068.56	56.152	5.026	1176.58	1056.99	19.929	5.048
13	1226.73	87.118	12.802	1284.59	1178.51	3.491	3.465
14	1394.53	66.199	14.095	1427.32	1286.52	14.22	5.31
15	1446.61	69.758	11.452	1492.9	1429.25	5.908	1.711
16	1516.05	93.606	1.067	1519.91	1492.9	0.474	0.075
17	1616.35	33.91	62.136	1811.16	1519.91	48.663	44.917
18	2335.8	82.144	3.405	2343.51	2279.86	2.777	0.432
19	2360.87	76.193	12.87	2391.73	2345.44	3.111	1.263
20	2686.84	97.792	1.778	2767.85	2505.53	1.211	0.886
21	2854.65	96.312	0.905	2864.29	2800.64	0.434	-0.042
22	2924.09	90.516	7.384	2995.45	2866.22	2.863	1.735
23	3412.08	35.372	61.484	3658.96	2997.38	173.041	165.315

Comment;
Ekstrak Daun Salam

Date/Time; 6/5/2018 2:06:50 PM
No. of Scans;
Resolution;
Apodization;



No.	Peak	Intensity	Corr. Intensity	Base (H)	Base (L)	Area	Corr. Area
1	399.26	93.513	2.279	410.84	366.46	0.99	0.459
2	422.41	94.017	0.95	464.13	412.77	1.296	0.266
3	547.78	97.501	0.226	561.29	530.42	0.321	0.015
4	673.16	96.795	0.67	682.8	655.8	0.106	0.049
5	711.73	96.697	0.853	734.66	696.3	0.16	0.072
6	833.25	96.397	1.111	854.47	775.36	0.303	0.14
7	1022.27	97.49	2.216	1065.92	964.41	0.742	0.591
8	1382.96	43.6	55.748	1477.47	1232.51	13.56	12.998
9	1516.05	97.212	0.796	1521.84	1494.83	0.239	0.056
10	1618.26	92.59	2.244	1641.42	1571.99	1.651	0.377
11	1645.28	94.037	0.366	1672.26	1641.42	0.633	0.004
12	1768.72	99.301	0.477	1786.06	1761.01	0.046	0.026
13	1869.02	99.434	0.497	1882.52	1857.45	0.04	0.032
14	2337.72	94.713	0.614	2345.44	2241.26	0.67	-0.294
15	2362.8	92.656	3.761	2393.66	2345.44	0.942	0.356
16	2424.52	96.456	1.063	2441.86	2393.66	0.164	0.091
17	2924.09	99.086	0.661	2947.23	2861.65	0.131	0.071
18	3010.88	99.005	0.455	3043.67	2972.31	0.231	0.067
19	3134.33	91.549	7.959	3319.49	3043.67	5.929	5.447
20	3446.79	95.126	0.225	3462.22	3433.29	0.617	0.016

Comment;
Nanopartikel AgI

Date/Time; 11/22/2018 3:15:02 PM
No. of Scans;
Resolution;
Apodization;

Lampiran 14. Hasil Analisis XRD

*** Basic Data Process ***

Group : Standard
Data : N#Ag#1

Strongest 3 peaks

no.	peak no.	2Theta (deg)	d (A)	I/I1	FWHM (deg)	Intensity (Counts)	Integrated Int (Counts)
1	3	37.7626	2.38034	100	0.92180	479	22303
2	16	77.3133	1.23317	45	0.98670	214	10203
3	13	64.3000	1.44756	35	0.73340	166	7050

Peak Data List

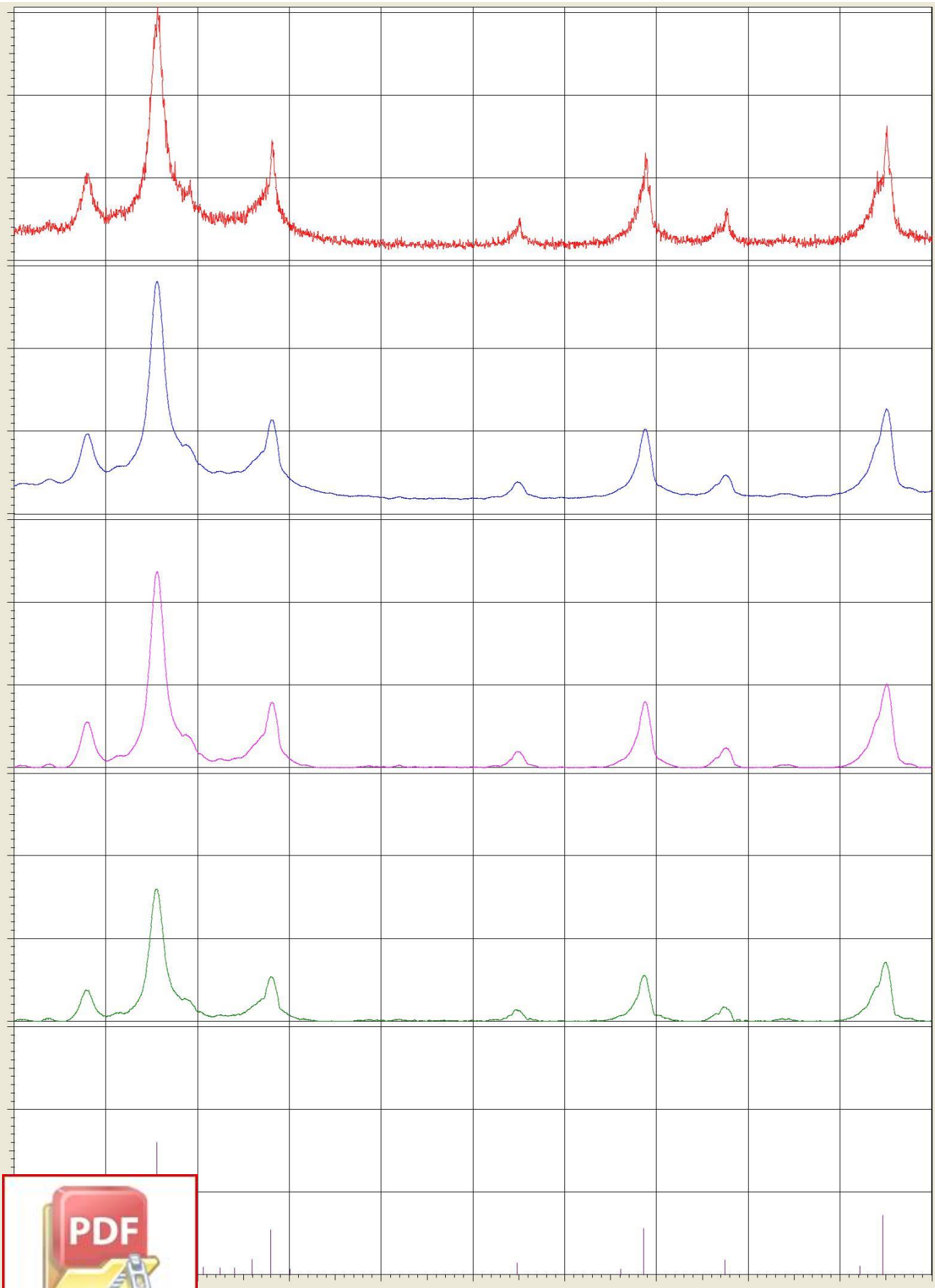
peak no.	2Theta (deg)	d (A)	I/I1	FWHM (deg)	Intensity (Counts)	Integrated Int (Counts)
1	33.9695	2.63696	23	0.82900	112	5041
2	35.7600	2.50892	6	1.42000	31	4299
3	37.7626	2.38034	100	0.92180	479	22303
4	39.3200	2.28958	17	1.18000	82	6397
5	40.3200	2.23507	6	0.92000	27	1645
6	41.2200	2.18832	5	0.00000	23	0
7	42.0000	2.14947	5	0.00000	24	0
8	42.9800	2.10270	11	1.04000	54	3506
9	43.9855	2.05693	34	0.77110	162	5602
10	45.0400	2.01120	4	0.74000	20	1351
11	57.4050	1.60392	9	0.73000	41	1952
12	63.0600	1.47300	4	0.74000	20	1452
13	64.3000	1.44756	35	0.73340	166	7050
14	68.7340	1.36459	11	0.66800	52	2228
15	76.0800	1.25006	6	0.70000	31	1950
16	77.3133	1.23317	45	0.98670	214	10203

```
          ***  Basic Data Process  ***

# Data Infomation
          Group                : Standard
          Data                 : N#Ag#1
          Sample Nmae          : serbuk
          Comment              :
          Date & Time          : 08-30-18 11:31:34

# Measurement Condition
    X-ray tube
          target: Cu
          voltage              : 40.0 (kV)
          current              : 30.0 (mA)
    Slits
          Auto Slit            : Used
          divergence slit      :   1.00000 (deg)
          scatter slit         :   1.00000 (deg)
          receiving slit       :   0.30000(mm)
    Scanning
          drive axis           : Theta-2Theta
          scan range           :   30.0000 - 80.0000 (deg)
          scan mode            : Continuous Scan
          scan speed           :    2.0000 (deg/min)
          sampling pitch       :    0.0200 (deg)
          preset time          :    0.60 (sec)

# Data Process Condition
    Smoothing                  [ AUTO ]
          smoothing points     : 47
    B.G.Subtruction            [ AUTO ]
          sampling points      : 51
          repeat times         : 30
    Ka1-a2 Separate            [ MANUAL ]
          Ka1 a2 ratio         : 50 (%)
    Peak Search                [ AUTO ]
          differential points  : 47
          FWHM threhold        : 0.050 (deg)
          intensity threhold   : 30 (par mil)
          FWHM ratio  (n-1)/n  : 2
    System error Correction    [ NO ]
    Precise peak Correction    [ NO ]
```




PDF
Optimization Software:
www.balesio.com