



A solution for your  
**nanotech** project

**PRIME** nano  
technology

# About me



Nutthaphol Khupsathianwong

M.Sc. NanoEngineering (UCSD)

B.Eng. NanoEngineering (CU)

Founder, CEO

COO

**PRIME**  
nano  
technology



คณะวิทยาศาสตร์  
จุฬาลงกรณ์มหาวิทยาลัย



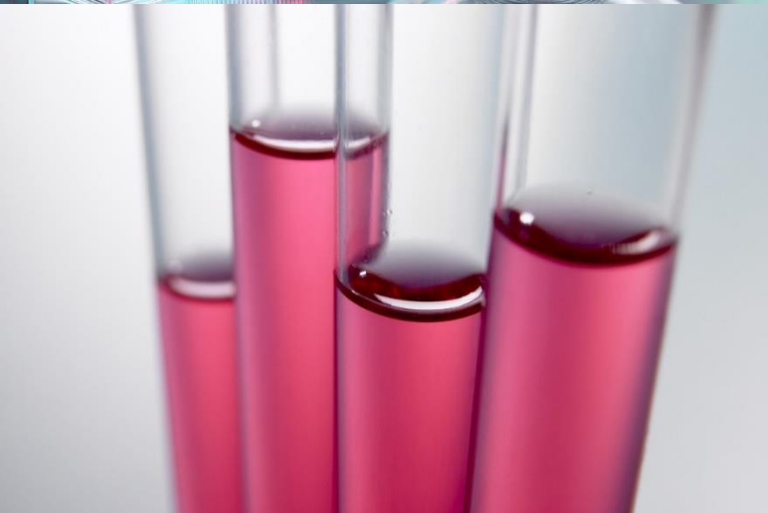
สวทช.  
NSTDA

**CU** INNOVATION  
HUB

เมือง  
นวัตกรรม  
แห่งสยาม

 **Newton  
Fund**

 **ROYAL  
ACADEMY OF  
ENGINEERING**



# About **PRIME**<sup>nano</sup> technology

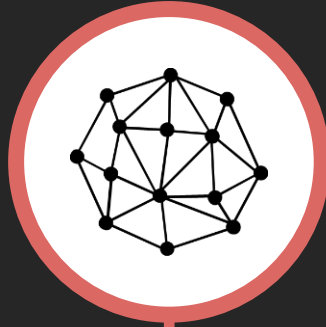
We are **THAI**  
nanotechnology-based  
company specializing in  
**nanomaterial synthesis**  
and applications.

We offer nano innovative  
products and services to  
suit your needs.

# Who we are

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# PRIME<sup>nano</sup> technology



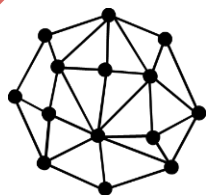
Nanomaterial  
supplier



Product  
developer



Nano-product  
manufacturer



# Nanomaterial supplier



## SILVER NANOPARTICLES

Applications:  
Antibacteria, Electronics,  
Sensors, Plasmonics, etc.

[Read More >](#)

## GOLD NANOPARTICLES

Applications:  
Imaging, SERS Substrate,  
Plasmonics, Biomedicine

[Read More >](#)

## METAL OXIDE NANOPARTICLES

Applications:  
Catalyst, Energy,  
Additives, Medicine

[Read More >](#)



## OTHER NANOPARTICLES

Nanomaterial you searched  
for is not here?  
[CONTACT US](#) for more info.

[Contact Us >](#)

Visit our website at [www.prime-nano.com](http://www.prime-nano.com)





Nanomaterial  
supplier

PRIME<sup>nano</sup>  
technology

## Academic Clients:



คณะวิทยาศาสตร์  
จุฬาลงกรณ์มหาวิทยาลัย

CHULA  $\Sigma$ ENGINEERING  
Foundation toward Innovation

NANO<sup>TEC</sup>  
a member of NSTDA

BIOTEC<sup>TEC</sup>  
a member of NSTDA



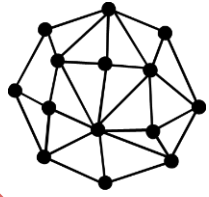
มหาวิทยาลัยเทคโนโลยี  
ราชมงคลพระนคร  
RAJAMANGALA UNIVERSITY OF TECHNOLOGY PHRA NAKHON



FACULTY OF SCIENCE  
KHON KAEN UNIVERSITY  
คณะวิทยาศาสตร์ มหาวิทยาลัยขอนแก่น



FACULTY OF ENGINEERING  
KMUTT  
KING MONSKUTS UNIVERSITY OF TECHNOLOGY THONBURI



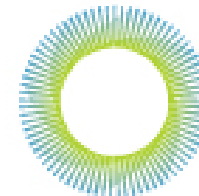
Nanomaterial  
supplier

PRIME<sup>nano</sup>  
technology

## Industrial Clients:



NUTRA PLUS



ชินโครตรอน  
ไทยแลนด์  
เป็นร่ำแล้ว



Product  
developer

**PRIME**  
nano  
technology

## Research & Development



Prototype Making



Customization



Prototype Testing

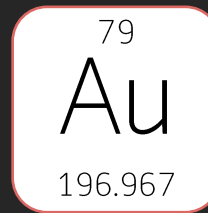


3<sup>rd</sup> party Certification





# Product developer



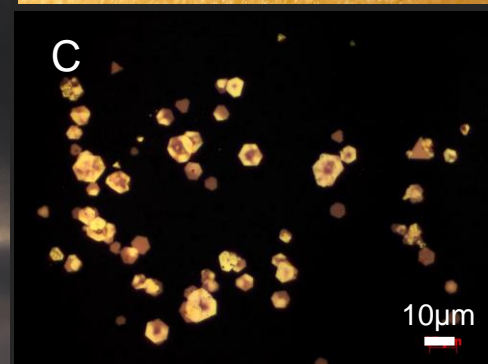
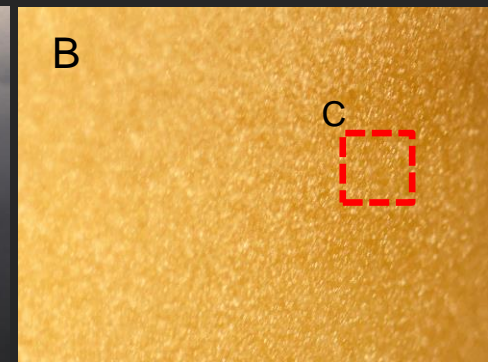
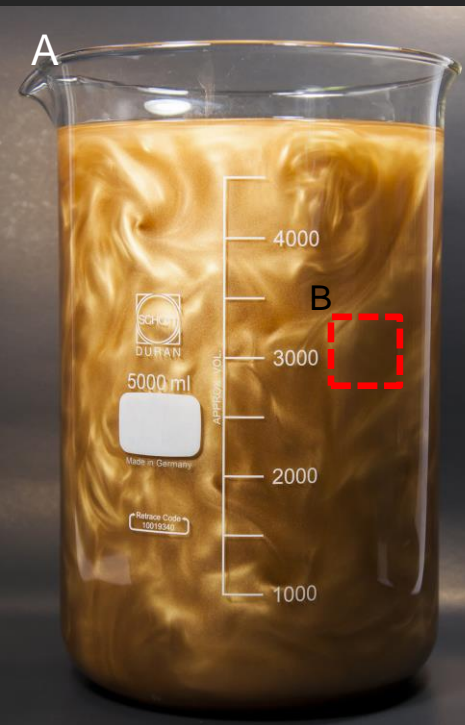
## 24K Gold NanoCrystals



**CHOND**  
ICEBERG REFRESHING MIST

**FINEST GOLD MINERAL ESSENCE**

ที่สุดของเอสเซนส์น้ำแร่ทองคำ





## Nano-Product manufacturer

**Be Jeans**  
BE CLEAN

Anti-bacteria  
Anti-odor  
Denim-friendly  
Nanotechnology

"Be Jeans", a deodorizer for denim, was developed based on innovative NanoSilver technology. We are proud to present a patented special type of NanoSilver called "Green Silver NanoPrisms". It stays longer on your denim and is better at killing odor-causing bacteria without altering the texture. More importantly, the spray itself is odorless. Have you ever seen the deodorizing sprays that are odorless? Here we have one!

**NANO SILVER DENIM REFRESHER**

For more information, contact:  
bejeans.beclean@gmail.com  
www.bejeans.co  
facebook.com/bejeans  
+66 (0) 90 970 0397

**Be Jeans**  
BE CLEAN

รักยีนส์.. แคะฉีด Be Jeans ก็พอ

**BE JEANS**  
@BEJEANS  
090-970-0397

# PRIME nano technology

## Technology



Nano  
Silver

#1 Mostly-used  
nanomaterials

>500

Products worldwide

[Antimicrobial & Conductive Applications]

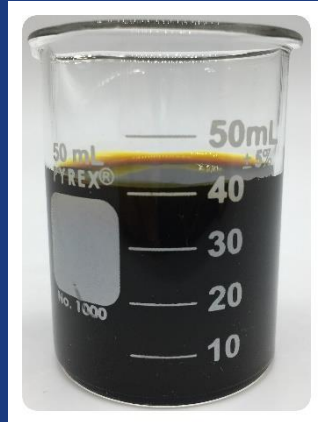
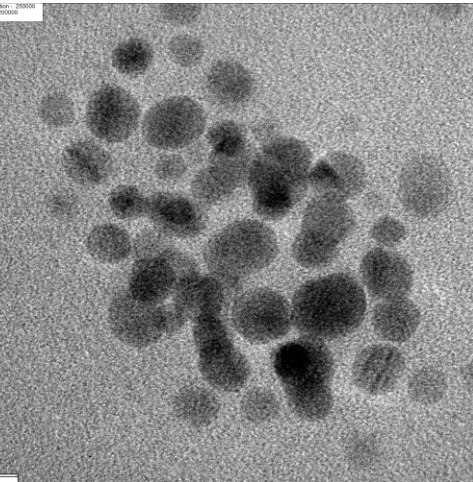
\$2Billion Market



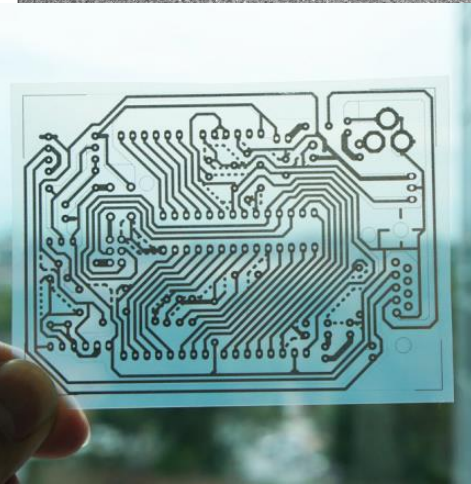
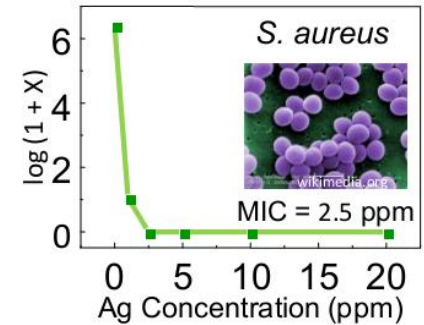
# NanoSilver

Silver <100nm

# Antimicrobial Agent



Against:  
Virus  
Fungi  
Bacteria



# Conductivity



# Antibacterial Activities

NANO SILVER  
(Ag<sup>0</sup>)

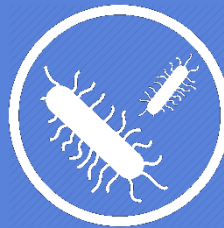


Ag<sup>+</sup>  
ROS<sup>•</sup>

VS  
Other antibac agents



Protective



Broad-spectrum

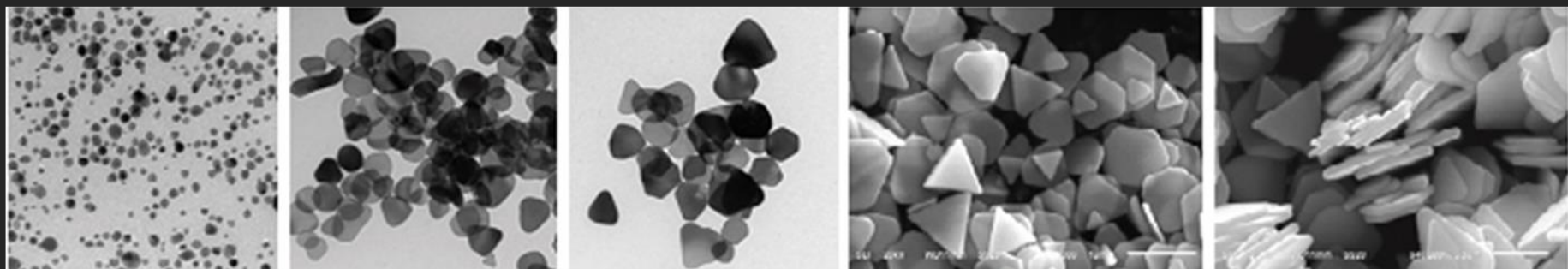


Long-Lasting

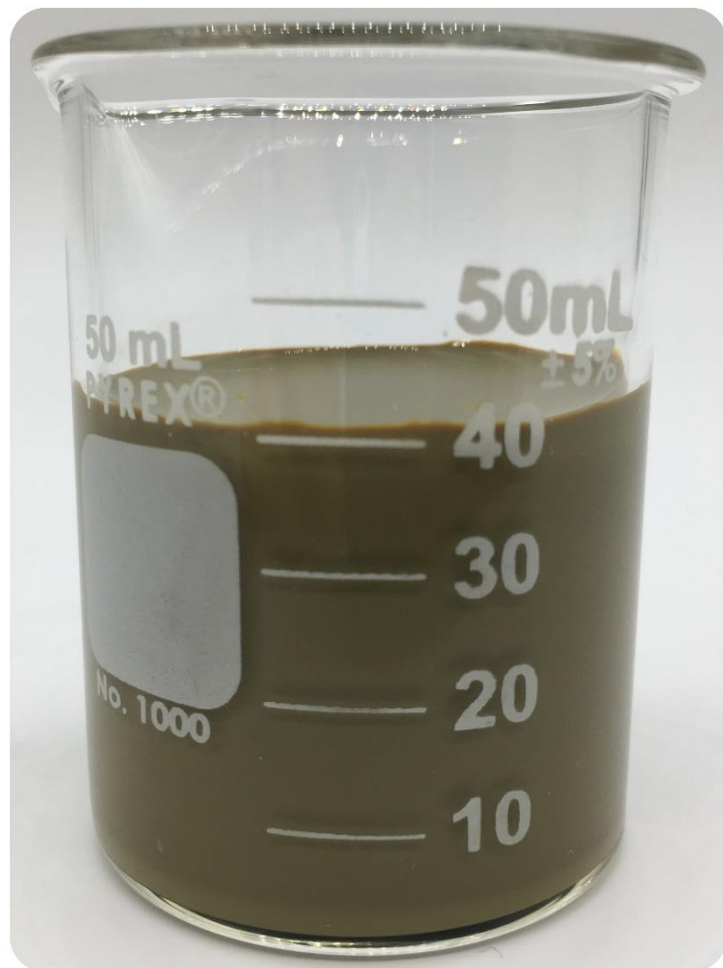




~ 5 nm      ~ 100 nm



← Nano Spheres →      Nano★ Plates →



**Silver Nanoparticles**  
**(ag-102)**  
**10,000ppm**

**Appearance:** Yellow brown colloid

**Particle Shape:** Nanospheres

**Average Particle Size:**  $15 \pm 10$  nm

**Concentration:** 10,000 part per million (ppm; equivalent to mg/L)

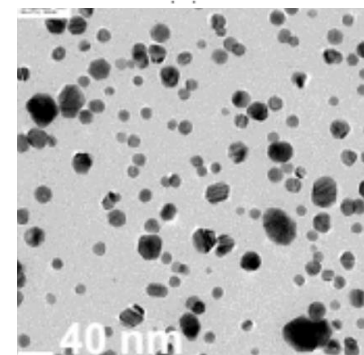
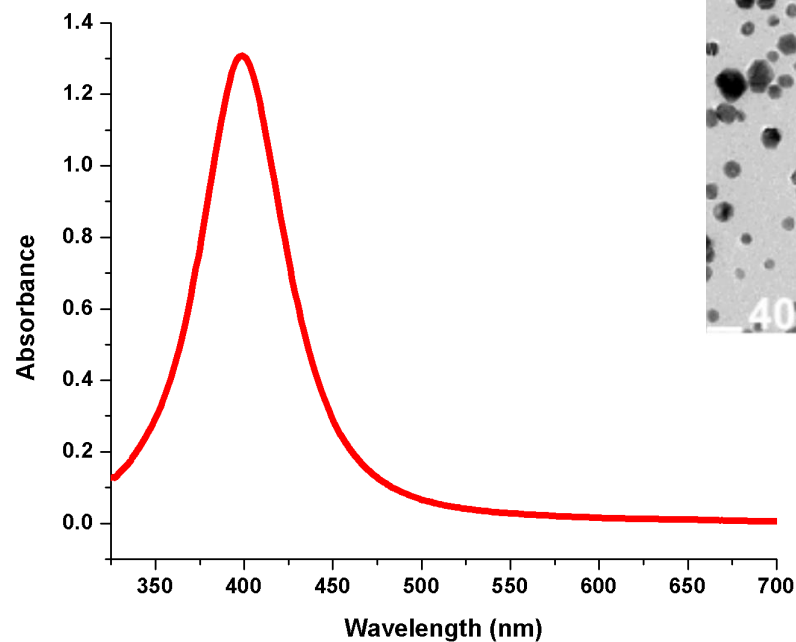
**Solvent:** Deionized water

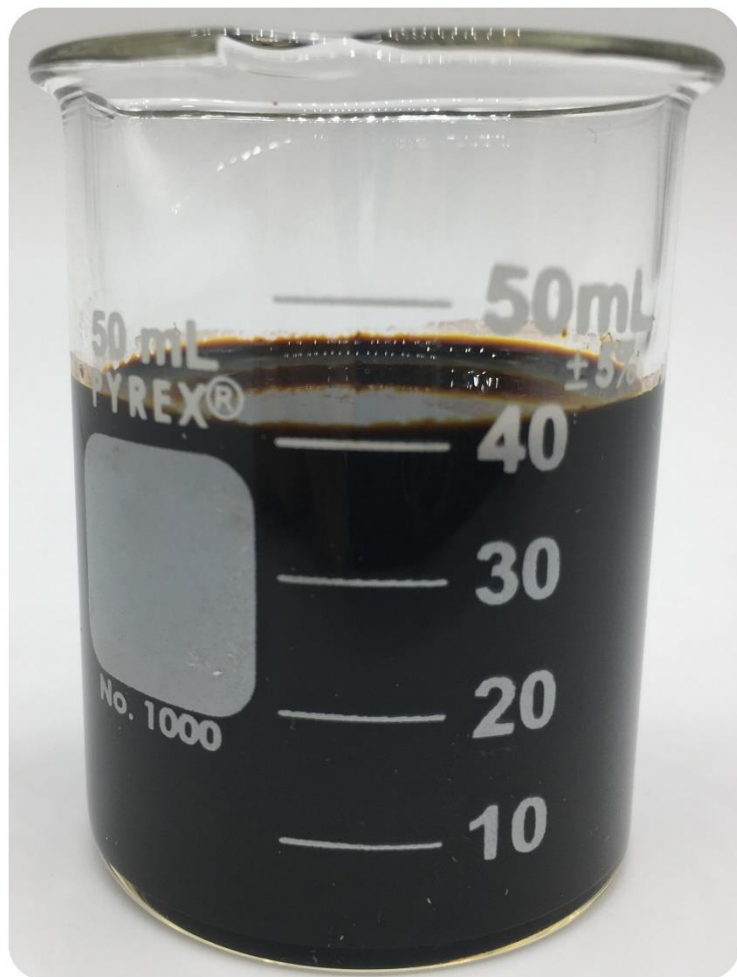
**Stabilizing Agent:** Soluble starch

**$\lambda_{\text{max}}$  (UV-VIS Absorbance):**  $400 \pm 10$  nm

**Stability:** 12 months

**Recommended dosage:** 0.1-2%





**Silver Nanoparticles**  
**(ag-122)**  
**10,000ppm**

**Appearance:** Dark yellow colloid

**Particle Shape:** Nanospheres

**Average Particle Size:**  $6 \pm 4$  nm

**Concentration:** 10,000 part per million (ppm; equivalent to mg/L)

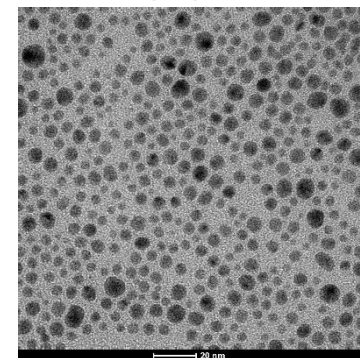
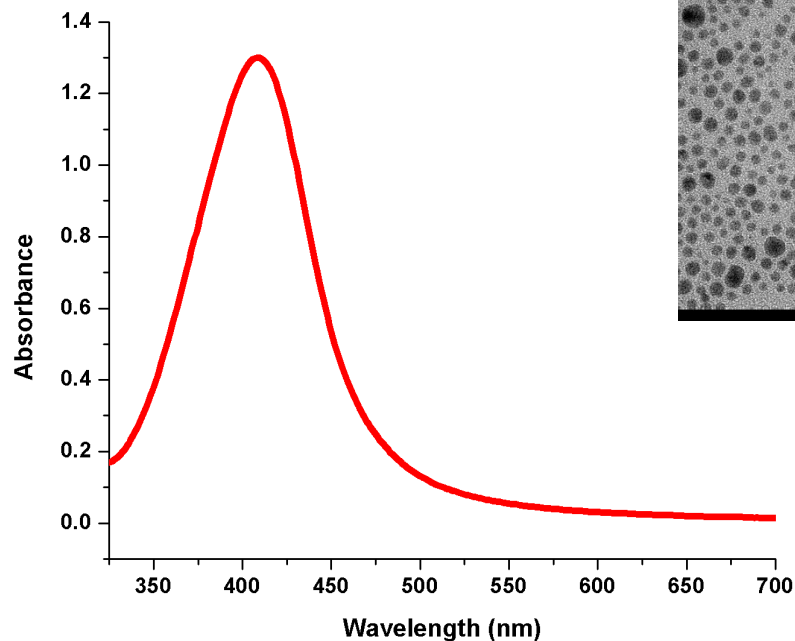
**Solvent:** Deionized water

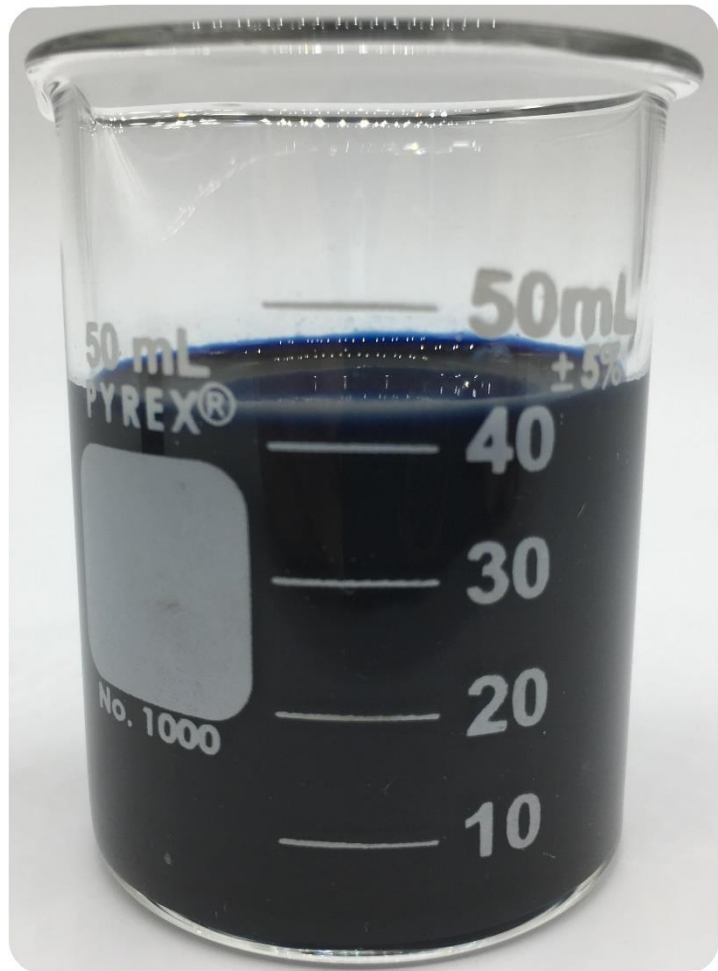
**Stabilizing Agent:** Tannic acid

**$\lambda_{\text{max}}$  (UV-VIS Absorbance):**  $410 \pm 10$  nm

**Stability:** 12 months

**Recommended dosage:** 0.1-2%





**Silver Nanoplates**  
**(ag-107)**  
**10,000ppm**

**Appearance:** Dark blue colloid

**Particle Shape:** Nanoplates

**Average Particle Size:** 80-120 nm lateral edges with 5-20 nm thickness

**Concentration:** 1,000 part per million (ppm; equivalent to mg/L)

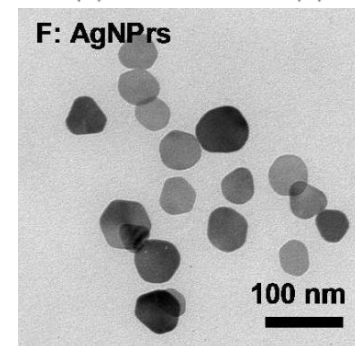
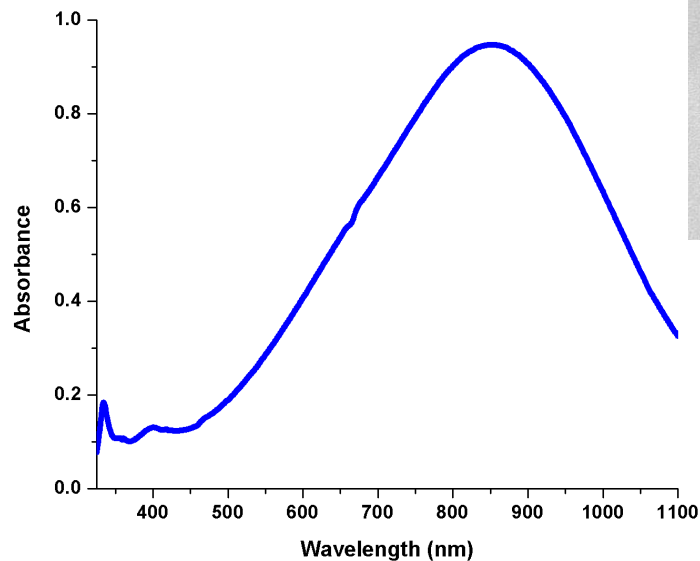
**Solvent:** Deionized water

**Stabilizing Agent:** Soluble starch

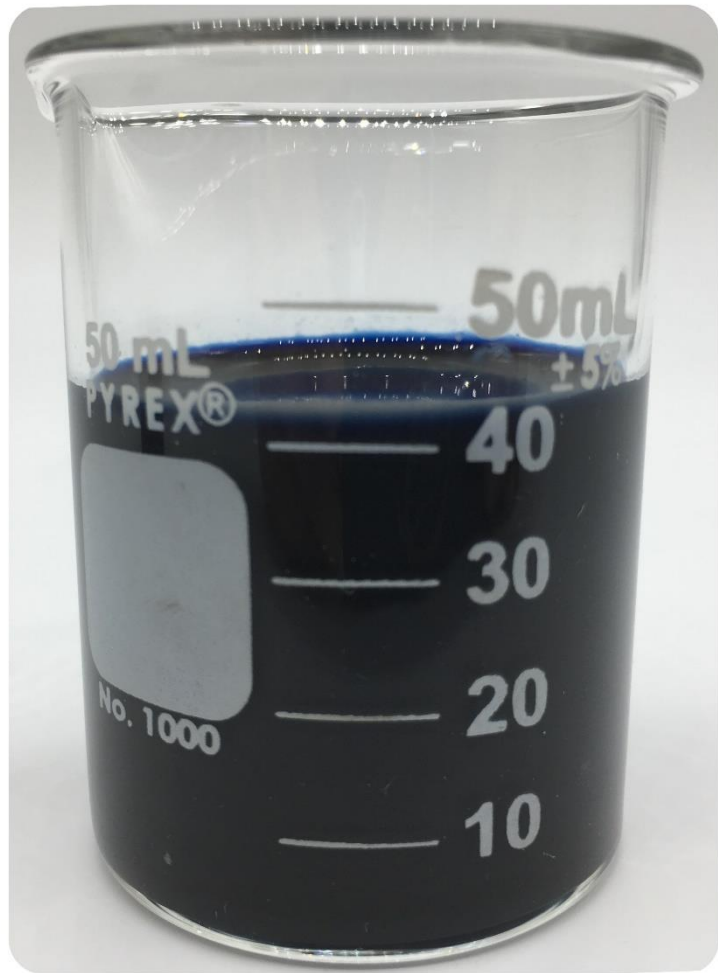
**$\lambda_{\text{max}}$  (UV-VIS Absorbance):**  $780 \pm 20$  nm

**Stability:** 12 months

**Recommended dosage:** 1-10%







Silver Nanoplates  
(ag-107)  
10,000ppm

BluRibbon

BioCellulose with Blue Silver Nano



Beyond all



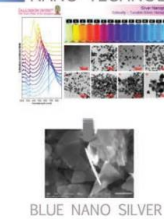
BluRibbon is a world-class innovation of advanced wound dressing product invented by Thai inventors which has been awarded the winner of National Innovation Awards 2012 for Social Contribution and Gold Medal Award from the Grand Prix of the 40<sup>th</sup> International Exhibition of Inventions of Geneva 2012.

1 NANO BIOCELLULOSE TECHNOLOGY



NANO BIOCELLULOSE

2 ENGINEERED SILVER NANO TECHNOLOGY



BLUE NANO SILVER

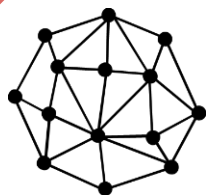
NanoBiocellulose



BlueSilverNano



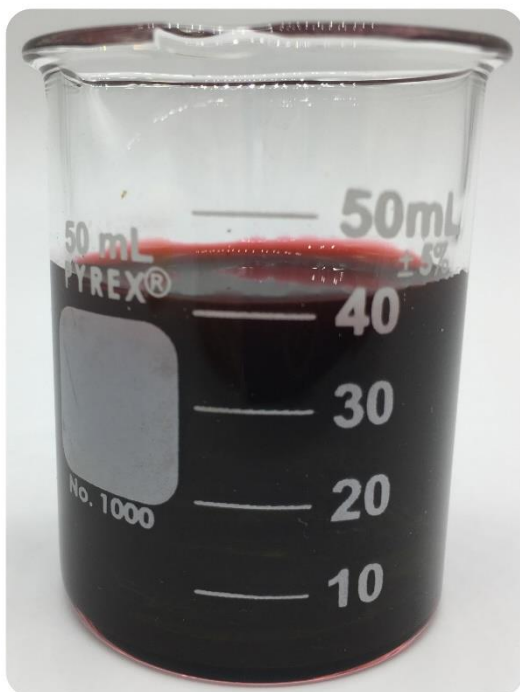
PRIME nano technology



# Nanomaterial supplier

79  
**Au**  
196.967

# Gold Nanoparticles



## Gold Nanoparticles (8-20nm; 1,000ppm)

**PRIME** nano  
technology

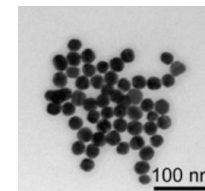
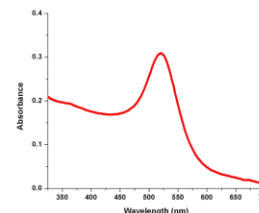
บริษัท ไพรม์ นาโนเทคโนโลยี จำกัด  
50 ซ.กาญจนาภิเษก 008 เขต 10 แขวงจตุจักร กรุงเทพฯ 10140  
โทร 090-973-7607 อีเมล Sale.PrimeNano@gmail.com

### Certificate of Analysis

Name:	au-101 (Gold nanoparticles)
Amount/Concentration:	1,000 part per million (ppm; equivalent to mg/L)
Appearance:	Ruby-red colloid
Average Particle Size:	8-20 nm
Method of Synthesis:	Chemical reduction
Date of Production (DD.MM.YY):	24.01.2019
Used by (DD.MM.YY):	24.07.2019
Lot. No.:	A240119

### Characterization: UV-Vis Spectroscopy

Wavelength of max absorbance: 520 nm (Acceptable range = 520±10 nm)



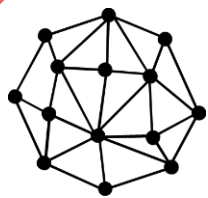
Date of Issue (DD.MM.YY): 25.01.2019

*Cose Qh*

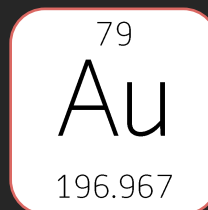
(Nutthaphol Khupsathianwong)

R&D, PRIME NANOTECHNOLOGY CO.,LTD.

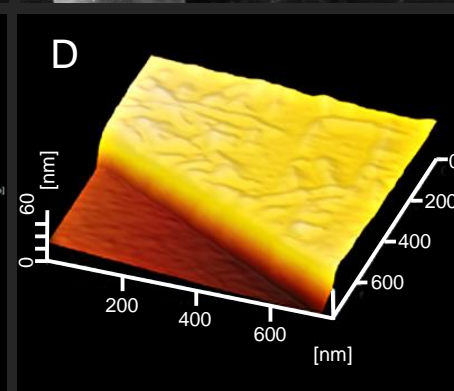
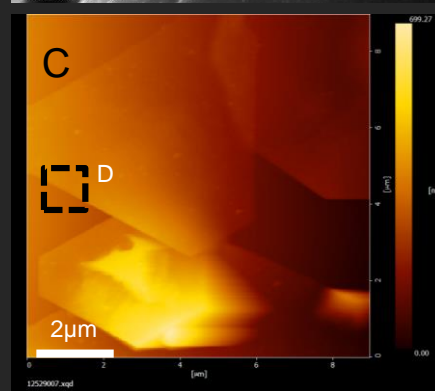
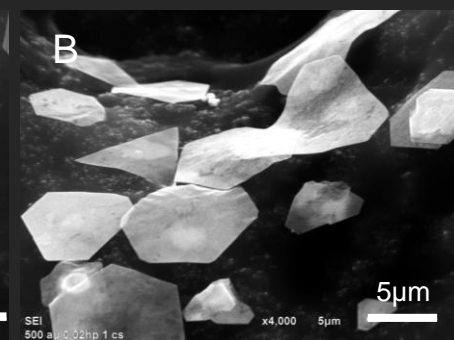
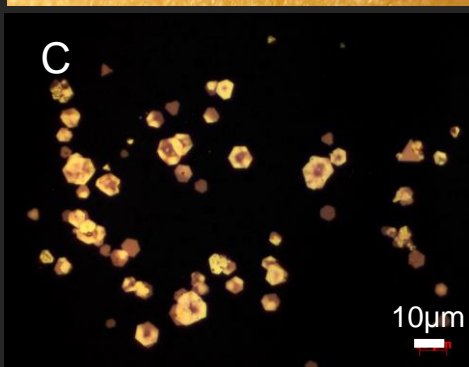
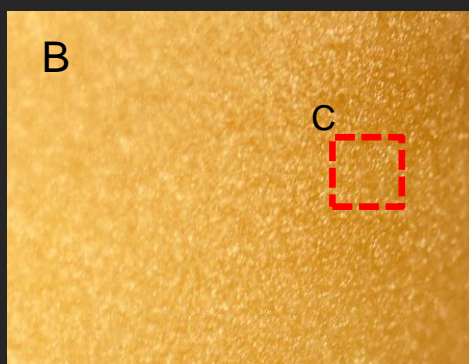
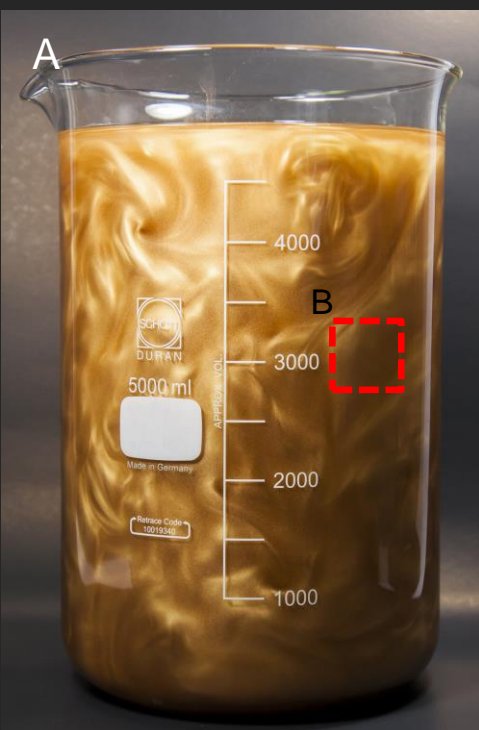




Nanomaterial  
supplier



24K Gold  
NanoCrystals



# PRIME<sup>nano</sup> technology



Nanomaterial  
Supplier



Nano-product  
Developer



Nano-product  
Manufacturer

- **FOUND IN 2013**
- SPIN OFF FROM CU SCIENCE
- MAIN PRODUCT = NANO SILVER
- **15+ PRODUCTS DEVELOPED**
- INTERNATIONAL AWARDS
- 9 GRANTS (NRCT, NSTDA, TRF)
- NEWTON FUND (UK)

2013

Founded

2015

NEWTON Fund  
From UK Gov.

ITEX Gold Medal

2017

Gov. Funding

2014

Joined CU/NSTDA  
Startup program

2016

Research Grants  
SIIF Bronze Medal

2018

SID Campaign  
Winner



# Thank You

Nutthaphol Khupsathianwong

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