

Version: 1.0 / EN

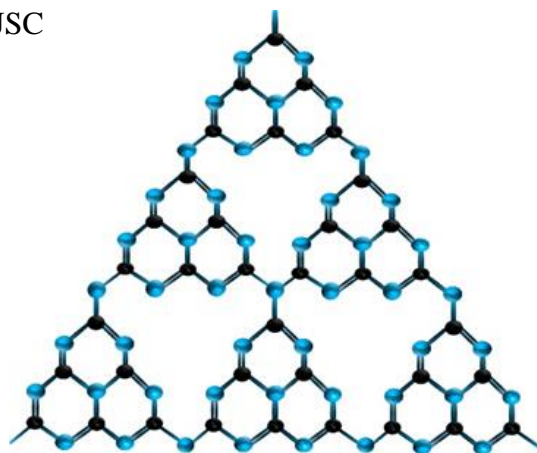
Revision Date: 27/08/2022

Ultrathin Graphitic Carbon Nitride Nanosheets (Ultra CN_x NSs)
((Pharmaceutical grade))

SECTION 1: IDENTIFICATION OF THE PRODUCT AND OF THE COMPANY

1.1 Product Information

Product Name:	Ultrathin Graphitic Carbon Nitride Nanosheets (Ultra CN _x NSs)
Brand:	Sanyar Partove Sharif PJSC
CAS-No.:	143334-20-7
Appearance:	light white powder
Physical State (30 deg. C):	solid
Purity:	min. 98.0 %
Length:	1-10 micro meter
Thickness:	less than 25 nm
Band gap:	2.9 eV



1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: Laboratory chemicals, Manufacturing of substances

1.3 Details of the supplier of the safety datasheet

Company:	Sanyar Partove Sharif
Address:	Unit 4, Second floor, Pam Tower, Jordan Boulevard, Tehran, Iran
Telephone:	+98 21 888 71 750
Email:	info@sunyar-ps.com
Website:	www.sanyar-ps.com

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Flammable liquids (Category 2), H225

Eye irritation (Category 2), H319

2.2 Label elements

Not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

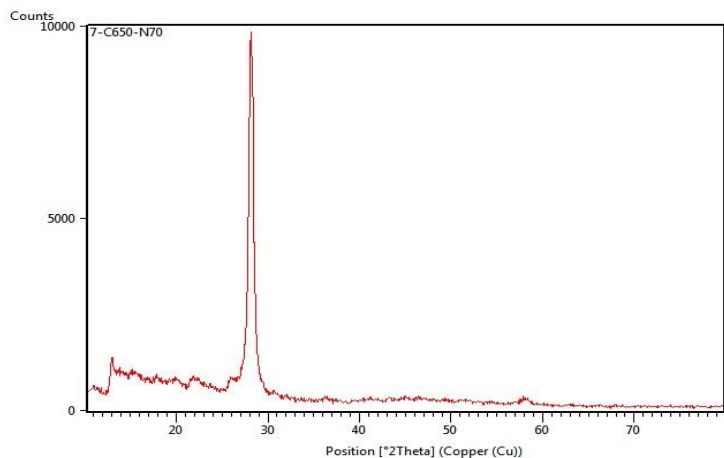
3.1 Substances

Substance name:	Ultrathin Graphitic Carbon Nitride Nanosheets (Ultra CN _x NSs)
CAS-No.:	143334-20-7
Synonym:	Poly [(8-amino-1,3,4,6,7,9,9b-heptaazaphenalene-2,5-diyl)imino] Molecular Weight: 201.14832
Molecular Formula:	C ₆ H ₃ *2N ₉

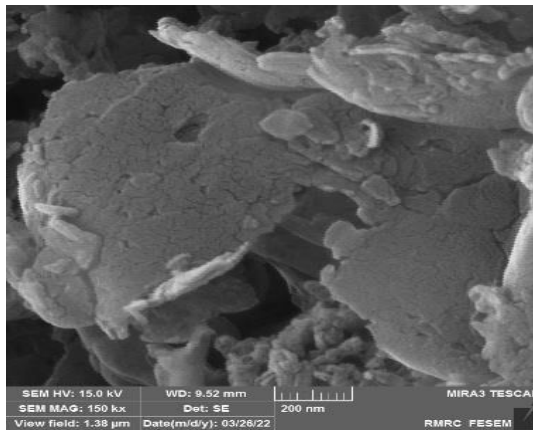
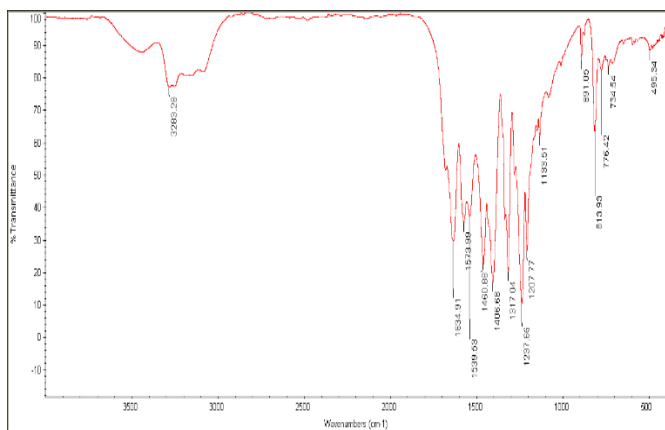
SECTION 4: Applications

Visible-light Photocatalysis	Antimicrobial agent
Air purification coatings	Water purification and disinfectant
Drug Delivery	

SECTION 4: Characterization

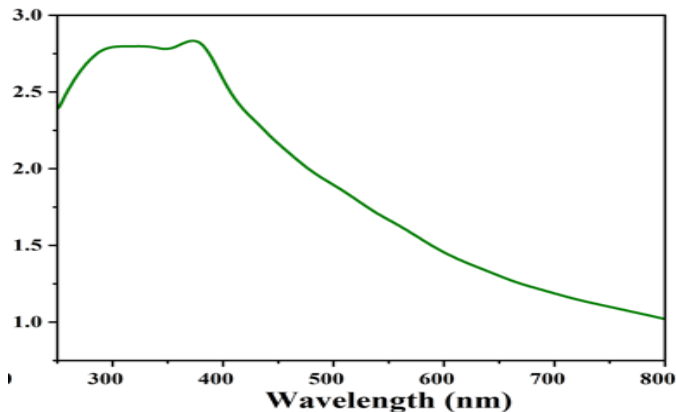


4.1 XRD PATTERN OF $g\text{-C}_3\text{N}_4$



4.2 FTIR PATTERN OF $g\text{-C}_3\text{N}_4$

4.3 FE-SEM image of $g\text{-C}_3\text{N}_4$



4.4 UV-VISIBLE OF $g\text{-C}_3\text{N}_4$

SECTION 5: FIRST AID MEASURES

5.1 General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

5.2 If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

5.3 In case of skin contact

Wash off with soap and plenty of water. Consult a physician. In case of eye contact
Flush eyes with water as a precaution.

5.4 If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist, or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

6.2 Environmental precautions

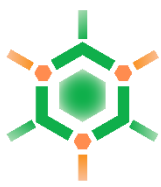
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Keep in suitable, closed containers for disposal.

6.4 Conditions for safe storage, including any incompatibilities

Keep the container tightly closed in a dry and dark place. Containers that are opened must be carefully resealed and kept upright to prevent leakage.



SECTION 7: EXPOSURE CONTROLS/PERSONAL PROTECTION

7.1 Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

7.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

7.3 Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching the glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection

Impervious clothing, flame retardant, antistatic protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let the product enter drains. Discharge into the environment must be avoided.

SECTION 8: Standards and Certificates for GRAPHENA shield

8.1 Accelerated Aging test

Accelerated Aging of Materials with antimicrobial properties
Standard Method: FDA guidance, WHO Guideline, ASTM 1980
According to Document No.: M1SH906261/01

The stability of graphene g-C₃N₄ at elevated temperatures for 12 months after Time 0 is validated. The results provide evidence to support that by storing the product at elevated temperatures, the antimicrobial property of the product was maintained for 12 months.

8.2 Evaluation of basic bactericidal activity Test of Finished Products

Anti-microbial graphene shield: Form Code: M1AG903261/01

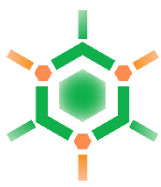
The results provide evidence to support that the Anti-microbial graphene shield has effective activity on Staphylococcus aureus ATCC 6538 and Pseudomonas aeruginosa ATCC 9027.

- Product activity on Staphylococcus aureus shows ≈ 0.4 log decrease of the bacterial count based on the forming colony on TSA.
- Product activity on Pseudomonas aeruginosa shows ≈ 0.5 log decrease of the bacterial count based on the forming colony on TSA.

8.3 Covid Test

In order to evaluate the antiviral properties of “Graphene Shield as a disinfectants manufactured by Sanyar Partove Sharif Co” the infectivity assay was carried out in Amirabad Virology Lab and the following results were obtained.

- 1) Graphene Shield reduced SARS-CoV2 titer up to 4 log when diluted 10 fold (1/10).
- 2) It reduced 5 log when diluted 5 fold (1/5).



8.4 Cytotoxicity test report

Reporting statements of conformity: On the basis of the results, interpreted according to ISO 10993-5:2009 the test sample "Carbon Nitride Powder (CNx) - Saniar Parto Sharif Company is considered **NON-CYTOTOXIC**.

8.5 Genotoxicity test report

Reporting statements of conformity:

On the basis of the results, interpreted according to ISO 10993-3:2014 the test sample "Carbon Nitride Powder (CNx) - Saniar Parto Sharif Company is considered **NON-GENOTOXIC**.

8.6 Hemolysis test report

Reporting statements of conformity:

On the basis of the results, interpreted according to ISO 10993-4:2017 the test sample "Carbon Nitride Powder (CNx) - Saniar Parto Sharif Company is considered **NON-Hemolytic** and **satisfied** the requirements of the test.

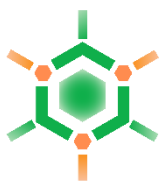
8.7 Tests for in-vivo irritation of Finished Products

Anti-microbial graphena shield

Test System

Food	Standard pellet provided from the authorized supplier
Housing	Healthy animals were acclimatized to the laboratory conditions before the treatment, and then they were individually housed in stainless steel suspended cages identified by a card indicating the Identification number of the test article and the first treatment date.
Personnel	Associates involved were appropriately qualified and trained.
Selection	Only healthy, previously unused animals were selected.
Environment	The room temperature and humidity was monitored daily.

The irritation response category in a rabbit of Anti-microbial graphena shield for 72±2 hours was 0, so the mean score is **Negligible**.



The results provide evidence to support that the Anti-microbial graphena shield is **Non-Irritating**.

8.8 Tests for skin sensitization of Finished Products

Anti-microbial graphena shield

Test System

Food	Standard pellet provided from the authorized supplier
Housing	Healthy animals were acclimatized to the laboratory conditions before the treatment, and then they were individually housed in stainless steel suspended cages identified by a card indicating the Identification number of the test article and the first treatment date.
Personnel	Associates involved were appropriately qualified and trained.
Selection	Only healthy, previously unused animals were selected.
Environment	The room temperature and humidity was monitored daily.

The sensitization response category in a Guinea pigs of Anti-microbial graphena shield for 48±2 hours were 0, so the mean score is **No visible change**.

The results provide evidence to support that the Anti-microbial graphena shield is **Non-Sensitizing**.