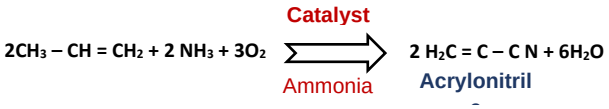
A&N Chemical Corp. Ltd.

ANCC

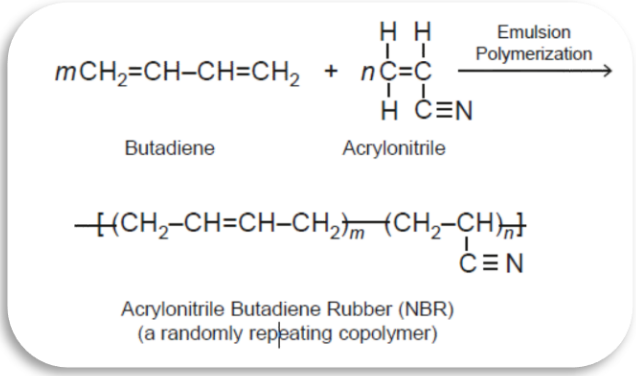
ANCOX- ACRYLONITRILE

AN OVERVIEW ON ACRYLONITRILE (ACN)

Much ACN is produced from ammoxidation of propylene feedstock as shown below. However, some are starting to produce ACN from ammoxidation of propane feedstock, which is 30% lower in cost than propylene.



There are 31 major producing plants in the world that make acrylonitrile. The top 14 firms that produce ACN are INEOS (with four plants in Germany, the United States, and the United Kingdom), Solutia (with their Alvin, Texas, plant), Asahi Kasei (Japan), TongSuh Petrochemical (South Korea), Formosa Plastics (Taiwan), DSM (Netherlands), Shanghai Secco Petrochemical (China), Jihua Group (China), Taekwang Industrial (South Korea), Cytec Industries (USA), China Petrochemical (Taiwan), DuPont (USA), Saratovorgsintez (Russia), and Shanghai Petrochemical (China). The total world capacity for producing acrylonitrile is over 15 billion pounds annually



Direct Rubber Industry Dependency

Acrylonitrile is an important monomer needed for the production of the oil-resistant acrylonitrile butadiene rubber (NBR). **Acrylonitrile** is the monomer used to produce polyacrylonitrile (PAN), which is pyrolyzed into carbon fiber used in tire construction and reinforcement. **Acrylonitrile** is an essential monomer to produce NBR, which is used as a feedstock to make hydrogenated nitrile rubber (HNBR). In addition, acrylonitrile is used to produce NBR, which is used to prepare a special NBR/PP thermoplastic vulcanizate (TPV) for better oil resistance. Lastly, acrylonitrile is used to produce NBR, which is used to make special masterbatches with polyvinyl chloride for improved aging and color properties.

Nonrubber Uses

Acrylonitrile is used as a feedstock to make acrylic fibers in the textile industry. Acrylonitrile is an important monomer used in the polymerization of ABS plastics. ACN is an important feedstock for adiponitrile (ADN) and acrylamide. Acrylamide, in turn, is used to manufacture carbon fibers (of which only a small fraction is used in tires), as well as for flocculants and oil recovery.

ANCOX- ACRYLONITRILE PRODUCTS

ANCOX®AP99-A

Description:
A high-quality colorless, volatile liquid Acrylonitrile with a pungent, onion-like odor.
Applications:
Acrylic fibers, resins (acrylonitrile butadiene-styrene, styrene-acrylonitrile and others) and nitrile rubbers (butadiene-acrylonitrile)
CAS Number: 107-13-1

ANCOX®AP99-B

Description:
A First-class colorless, volatile liquid Acrylonitrile with a pungent, onion-like odor.
Applications:
Acrylic fibers, resins (acrylonitrile butadiene-styrene, styrene-acrylonitrile and others) and nitrile rubbers (butadiene-acrylonitrile)
CAS Number: 107-13-1

ANCOX®AP99-C

Description:
A Qualified colorless, volatile liquid Acrylonitrile with a pungent, onion-like odor.
Applications:
Acrylic fibers, resins (acrylonitrile butadiene-styrene, styrene-acrylonitrile and others) and nitrile rubbers (butadiene-acrylonitrile).
CAS Number: 107-13-1

ANCOX®AP99-VC 1410

Description:
An organic compound with the formula CH2CHCN. It is a colorless volatile liquid, or yellow.
Applications:
Acrylic fibers, resins (acrylonitrile butadiene-styrene, styrene-acrylonitrile and others) and nitrile rubbers (butadiene-acrylonitrile).
CAS Number: 107-13-1

ANCOX®AP99-VC 1411

Description:
An organic compound with the formula CH2CHCN. It is a colorless volatile liquid, although commercial samples can be yellow due to impurities. In terms of its molecular structure.
Applications:
99%+ used in the manufacture of acrylic fibers, resins (acrylonitrile butadiene-styrene, styrene-acrylonitrile and others) and nitrile rubbers.
CAS Number: 107-13-1

ANCOX®AP99-ML1810

Description:
An unsaturated aliphatic nitrile.

Applications:
99% used as a replacement for acrylonitrile in the manufacture of an acrylonitrile / butadiene / styrene-like polymer.
CAS Number: 126-98-7

ANCOX®AP99-P4095

Description:
Polyacrylonitrile-PAN) is the polymer of acrylonitrile.
Applications:
Used as fibers in outdoor awning, sails for yachts, and fiber-reinforced concrete, polymeric carbon.
CAS Number: 25014-41-9

ANCOX®AP99-P4835

Description:
Polyacrylonitrile-PAN is the polymer of acrylonitrile.
Applications:
Used as packing filler, fireproofing and carbon fiber after weaving. Also used in hydrogen storage.
CAS Number: 25014-41-9

ANCOX®AP99-A

ANCOX®AP99-A is a colorless, volatile liquid Acrylonitrile with a pungent, onion-like odor. ANCOX®99 is the chemical compound with the formula CH2CHCN. This pungent-smelling, colorless liquid often appears yellow due to impurities. It is an important monomer for the manufacture of useful plastics. In terms of its molecular structure, it consists of a vinyl group linked to a nitrile. Also known as 2-Propenenitrile, Vinyl cyanide; Cyanoethylene, AN.

Chemical formula	C_3H_3N
Appearance - liquid	Colorless transparent
Color (Pt-Co): ≤	5
PH (5% water solution)	6.0-8.0
Titration value (5% water solution)-ML ≤	2
Total cyanogen (Hydrocyanic acid content) (mg/kg) ≤	5
Polymerization inhibitor, 4-Methoxyphenol content (mg/kg)	35-45
Water content - %	0.20-0.45
Acetone content (mg/kg) ≤	80
Acrolein content (mg/kg) ≤	10
Meth acrylonitrile content (mg/kg) ≤	300
Acetonitrile content (mg/kg) ≤	150
Oxazole content (mg/kg) ≤	200
Propionitrile content (mg/kg) ≤	100
Acrylonitrile content /%	99.5
Fe content (mg/kg) ≤	0.1
Cu content (mg/kg) ≤	0.1
Hydrogen peroxide content (mg/kg) ≤	0.2
Total aldehydes (Acetaldehyde content) (mg/kg) ≤	30
Acidity (in Acetic acid) (mg/kg) ≤	20

ANCOX®AP99-A is widely used in industry to produce rubber, resins, plastics, elastomers and synthetic fibers and to manufacture carbon fibers used in aircraft, defense and aerospace industries. Exposure to acrylonitrile irritates the mucous membranes and causes a headache, nausea, dizziness, impaired judgment, difficulty breathing, limb weakness, cyanosis, convulsions and collapse

Safety Note:

Acrylonitrile is very toxic by ingestion, inhalation, or absorption through the skin. Symptoms of poisoning will begin with irritation of the eyes, limb weakness, difficulty in breathing, dizziness and impaired judgment. If the degree of poisoning increases, the symptoms will progress to cyanosis, nausea, collapse and loss of consciousness, irregular breathing, convulsions, respiratory arrest and possible death. Cardiac arrest can occur without warning when advanced symptoms of poisoning are exhibited.

Packing:

Acrylonitrile is stored in pressurized tanks.

ANCOX®AP99-B

ANCOX®AP99-B is a colorless, volatile liquid Acrylonitrile with a pungent, onion-like odor. ANCOX®99 is the chemical compound with the formula CH2CHCN. This pungent-smelling, colorless liquid often appears yellow due to impurities. It is an important monomer for the manufacture of useful plastics. In terms of its molecular structure, it consists of a vinyl group linked to a nitrile. Also known as 2-Propenenitrile, Vinyl cyanide; Cyanoethylene, AN.

Chemical formula	C_3H_3N
Appearance- liquid	Colorless transparent
Color (Pt-Co): ≤	5
Titration value (5% water solution) - ML ≤	6.0-8.0
Total cyanogen (Hydrocyanic acid content) (mg/kg) ≤	2
Water content - %	5
Acetone content (mg/kg) ≤	35-45
Acrolein content (mg/kg) ≤	0.20-0.45
Acetonitrile content (mg/kg) ≤	80
Fe content (mg/kg) ≤	10
Cu content (mg/kg) ≤	300
Hydrogen peroxide content (mg/kg) ≤	150
Total aldehydes (Acetaldehyde content) (mg/kg) ≤	200
Acidity (in Acetic acid) (mg/kg) ≤	100
Chemical formula	99.5
Appearance	0.1
Color (Pt-Co): ≤	0.1
Titration value (5% water solution)-ML ≤	0.2
Total cyanogen (Hydrocyanic acid content) (mg/kg) ≤	30
Water content-%	20

ANCOX®AP99-B is widely used in industry to produce rubber, resins, plastics, elastomers and synthetic fibers and to manufacture carbon fibers used in aircraft, defense and aerospace industries. Exposure to acrylonitrile irritates the mucous membranes and causes a headache, nausea, dizziness, impaired judgment, difficulty breathing, limb weakness, cyanosis, convulsions and collapse.

Safety Note:

Acrylonitrile is very toxic by ingestion, inhalation, or absorption through the skin. Symptoms of poisoning will begin with irritation of the eyes, limb weakness, difficulty in breathing, dizziness and impaired judgment. If the degree of poisoning increases, the symptoms will progress to cyanosis, nausea, collapse and loss of consciousness, irregular breathing, convulsions, respiratory arrest and possible death. Cardiac arrest can occur without warning when advanced symptoms of poisoning are exhibited.

Packing:

Acrylonitrile is stored in pressurized tanks.

ANCOX®AP99-C

ANCOX®AP99-C is a colorless, volatile liquid Acrylonitrile with a pungent, onion-like odor. ANCOX®99 is the chemical compound with the formula CH2CHCN. This pungent-smelling, colorless liquid often appears yellow due to impurities. It is an important monomer for the manufacture of useful plastics. In terms of its molecular structure, it consists of a vinyl group linked to a nitrile. Also known as 2-Propenenitrile, Vinyl cyanide; Cyanoethylene, AN.

Chemical formula	C_3H_3N
Appearance - Liquid	Colorless transparent
Color **(Pt**-Co) ≤	10
Titration value (5% water **solution) -** ML ≤	3
Total cyanogen (Hydrocyanic acid content) (mg/kg) ≤	20
Water content **-** %	0.20-0.60
Acetone content (mg/kg) ≤	200
Acrolein content (mg/kg) ≤	40
Acetonitrile content (mg/kg) ≤	200
Fe content (mg/kg) ≤	0.2
Hydrogen peroxide content (mg/kg) ≤	0.04
Total aldehydes (Acetaldehyde content) (mg/kg) ≤	100

ANCOX®AP99-C is widely used in industry to produce rubber, resins, plastics, elastomers and synthetic fibers and to manufacture carbon fibers used in aircraft, defense and aerospace industries. Exposure to acrylonitrile irritates the mucous membranes and causes a headache, nausea, dizziness, impaired judgment, difficulty breathing, limb weakness, cyanosis, convulsions and collapse.

Safety Note:

Acrylonitrile is very toxic by ingestion, inhalation, or absorption through the skin. Symptoms of poisoning will begin with irritation of the eyes, limb weakness, difficulty in breathing, dizziness and impaired judgment. If the degree of poisoning increases, the symptoms will progress to cyanosis, nausea, collapse and loss of consciousness, irregular breathing, convulsions, respiratory arrest and possible death. Cardiac arrest can occur without warning when advanced symptoms of poisoning are exhibited.

Packing:

Acrylonitrile is stored in pressurized tanks.

ANCOX®AP99-VC 1410

ANCOX®AP99-VC 1410 is an organic compound with the formula CH2CHCN. It is a colorless volatile liquid, although commercial samples can be yellow due to impurities. In terms of its molecular structure. Also known as 2-Propenenitrile, Vinyl cyanide; Cyanoethylene, AN.

Chemical formula	$CH_2CH.CN$
Assay	99%
Boiling point	77 °C(lit.)
Melting point	-83 °C(lit.)
Refractive index	1.390-1.392
Wt. per ml at 20°C	0.805-0.807g
Mol. Weight	53.06

ANCOX®AP99-VC 1410 (OTTO)
Acrylonitrile, 99% used in the manufacture of acrylic fibers, resins (acrylonitrile butadiene-styrene, styrene-acrylonitrile and others) and nitrile rubbers (butadiene-acrylonitrile).

Safety Note:
Acrylonitrile is very toxic by ingestion, inhalation, or absorption through the skin. Symptoms of poisoning will begin with irritation of the eyes, limb weakness, difficulty in breathing, dizziness and impaired judgment. If the degree of poisoning increases, the symptoms will progress to cyanosis, nausea, collapse and loss of consciousness, irregular breathing, convulsions, respiratory arrest and possible death. Cardiac arrest can occur without warning when advanced symptoms of poisoning are exhibited.

Packing:
Acrylonitrile is stored in pressurized tanks.

ANCOX®AP99-VC 1411

ANCOX®AP99-VC 1411 is an organic compound with the formula CH2CHCN. It is a colorless volatile liquid, although commercial samples can be yellow due to impurities. In terms of its molecular structure. Also known as 2-Propenenitrile, Vinyl cyanide; Cyanoethylene, AN.

Chemical formula	$CH_2CH.CN$
Appearance	Colorless liquid
Assay - %	99%
Boiling point - °C(lit.)	77
Melting point - °C(lit.)	-83
Refractive index	1.390-1.392
Wt. per ml at 20°C - g	0.805-0.807
Mol. Weight	53.06
Grade	AR / GR

ANCOX®AP99-VC 1411 (OTTO)
Acrylonitrile, GR 99%+ used in the manufacture of acrylic fibers, resins (acrylonitrile butadiene-styrene, styrene-acrylonitrile and others) and nitrile rubbers (butadiene-acrylonitrile).

Safety Note:
Acrylonitrile is very toxic by ingestion, inhalation, or absorption through the skin. Symptoms of poisoning will begin with irritation of the eyes, limb weakness, difficulty in breathing, dizziness and impaired judgment. If the degree of poisoning increases, the symptoms will progress to cyanosis, nausea, collapse and loss of consciousness, irregular breathing, convulsions, respiratory arrest and possible death. Cardiac arrest can occur without warning when advanced symptoms of poisoning are exhibited.

Packing:
Acrylonitrile is stored in pressurized tanks.

ANCOX® AP99-ML1810

ANCOX®AP99-ML1810 Meth acrylonitrile is a chemical compound that is an unsaturated aliphatic nitrile.
Also known as: Meth acrylonitrile (stabilized with MEHQ).

Chemical formula	C_4H_5N
Appearance	Colorless liquid
Assay - %	99%
Boiling point - °C(lit.)	90
Density - g/ml	0.8
Odor	Bitter almonds
Mol. Weight	67.09
Grade	Puriss

ANCOX®AP99-ML1810 Meth acrylonitrile, 99% used as a replacement for acrylonitrile in the manufacture of an acrylonitrile / butadiene / styrene-like polymer. M 1810 (OTTO) Meth acrylonitrile, 99% used in the preparation of homopolymers, copolymers, elastomers, and plastics and as a chemical intermediate in the preparation of acids, amides, amines, esters, and other nitriles.

Safety Note:

Acrylonitrile is very toxic by ingestion, inhalation, or absorption through the skin. Symptoms of poisoning will begin with irritation of the eyes, limb weakness, difficulty in breathing, dizziness and impaired judgment. If the degree of poisoning increases, the symptoms will progress to cyanosis, nausea, collapse and loss of consciousness, irregular breathing, convulsions, respiratory arrest and possible death. Cardiac arrest can occur without warning when advanced symptoms of poisoning are exhibited.

Packing:

Acrylonitrile is stored in pressurized tanks.

ANCOX® AP99-P4095

ANCOX®AP99-P4095 (Polyacrylonitrile-PAN) is the polymer of acrylonitrile. PAN molecule has strong polar nitrile groups. It is relatively insoluble in nature. PAN based carbon fibers possess very high strength compared to other polymeric precursors. When subjected to heat treatment, it can produce high carbon yield giving rise to thermally stable, highly oriented, graphite like molecular structure. Also known as: PAN, Vinyl cyanide.

Chemical formula	$(C_3H_3N)_n$
Appearance	Powder and chunks
Color	White to yellow
Infrared spectrum	Conforms to structure
Refractive index	n20/D 1.514
Density	1.184 g/mL at 25 °C(lit.)
Mol. Weight	Mw 150,000

ANCOX®AP99-P4095 (Polyacrylonitrile), average Mw 150,000 used as fibers in outdoor awning, sails for yachts, and fiber-reinforced concrete. ANCOX®AP99-P4095, average Mw 150,000 used as polymeric carbon precursor to form carbon fibers, electro spun activated carbon materials having meso-macro pores, carbon black additives.

Safety Note:

Acrylonitrile is very toxic by ingestion, inhalation, or absorption through the skin. Symptoms of poisoning will begin with irritation of the eyes, limb weakness, difficulty in breathing, dizziness and impaired judgment. If the degree of poisoning increases, the symptoms will progress to cyanosis, nausea, collapse and loss of consciousness, irregular breathing, convulsions, respiratory arrest and possible death. Cardiac arrest can occur without warning when advanced symptoms of poisoning are exhibited.

Packing:

5 x 1 kg – POR / 4 x 25 kg – POR

ANCOX® AP99-P4095

ANCOX®AP99-P4095 (Polyacrylonitrile-PAN is the polymer of acrylonitrile. Also known as PAN, Vinyl cyanide.

Chemical formula	$(C_3H_3N)_n$
Appearance	Powder and chunks
Color	White to yellow
Density	1.184 g/mL at 25 °C(lit.)
Grade	pract

ANCOX®AP99-P4095 (Polyacrylonitrile), average Mw 150,000 used as fibers in outdoor awning, sails for yachts, and fiber-reinforced concrete. ANCOX®AP99-P4095, average Mw 150,000 used as polymeric carbon precursor to form carbon fibers, electro spun activated carbon materials having meso-macro pores, carbon black additives.

Safety Note:

Acrylonitrile is very toxic by ingestion, inhalation, or absorption through the skin. Symptoms of poisoning will begin with irritation of the eyes, limb weakness, difficulty in breathing, dizziness and impaired judgment. If the degree of poisoning increases, the symptoms will progress to cyanosis, nausea, collapse and loss of consciousness, irregular breathing, convulsions, respiratory arrest and possible death. Cardiac arrest can occur without warning when advanced symptoms of poisoning are exhibited.

Packing:

5 x 1 kg – POR / 4 x 25 kg – POR

AN CHEMICAL CORPORATION

ANcc

ANCC was founded in 2000 in the heart of Chemicals world. ANCC, a Chemicals supplier and strategic partner to all Process & Non-Process worldwide industries, is the leading supplier of cutting-edge science and technologies. ANCC is an important unit of the customer's organization, to be ensured products quality are not only in line with worldwide standards but also stockholder's interests would be assuring in all of financially, socially, healthy, happiness, and environmental aspects.

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