

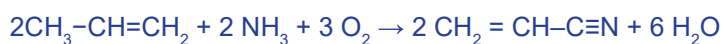
## Acrylonitrile (ACN)



Acrylonitrile is an organic compound with the formula  $\text{CH}_2\text{CHCN}$ . It is a colorless volatile liquid although commercial samples can be yellow due to impurities. It has a pungent odor of garlic or onion. In terms of its molecular structure, it consists of a vinyl group linked to a nitrile. It is an important monomer for the manufacture of useful plastics such as polyacrylonitrile and ABS. It is reactive and toxic at low doses. ACN was first synthesized by the French chemist Charles Moureu in 1893.

### Production

ACN is produced by catalytic ammoxidation of propylene, also known as the SOHIO process. Acetonitrile and hydrogen cyanide are significant byproducts that are recovered for sale. About 90% of the worldwide ACN is manufactured today by the ammoxidation of propene, as described by the reaction:



The reaction is highly exothermic ( $\Delta H = -123$  kcal/mol) and takes place in gaseous phase over a suitable catalyst at temperatures of 300 – 500 °C and pressures of 1.5-3 bar in fluid-bed or fixed-bed reactors with efficient cooling. The catalyst employed makes the difference in technologies. The first commercial plant built by **SOHIO** (now BP International) used a catalyst based on  $\text{Bi}_2\text{O}_3\cdot\text{MoO}_3$ . Since then, numerous chemical formulations have been patented. The catalyst should be multifunctional and possess redox properties. The most commonly employed contain molybdenum or antimony oxides mixed with transition metals, such as Fe, Ni, Co and V, activated by alkali - and rare-earth elements.



## Acrylonitrile (ACN)



Using much cheaper propane instead of propene was proposed in recent years. The difference in price should allow drop in manufacturing costs of about 15 – 20%. On the other hand, the problem of selectivity becomes even more challenging, because the catalyst should perform in-situ dehydrogenation simultaneously with ammoxidation.

### Applications

ACN is used principally as a monomer to prepare polyacrylonitrile, a homopolymer, or several important copolymers, such as styrene acrylonitrile (SAN), acrylonitrile butadiene styrene (ABS), acrylonitrile styrene acrylate (ASA), and other synthetic rubbers such as acrylonitrile butadiene (ABR). Hydrodimerization of acrylonitrile affords adiponitrile, used in the synthesis of certain nylons. ACN is also a precursor in the industrial manufacture of acrylamide and acrylic acid.



### Packing and storage







ACN is a toxic and flammable substance with high vapor pressure, so the necessary arrangements for its transportation must be considered. Based on the volume ordered by the customer, the type of packing is in the form of 200 kg barrels, isotank or in bulk. Shelf life of this chemical is 3 months.

Rayeneh Group is fully prepared to supply the ACN continuously and just in time delivery at a competitive price.



### Who we are

*Rayeneh Group is an international supplier of chemicals, catalysts, and equipment in the Oil, Gas, Petrochemical, and Mine Industries. Since its establishment in 1999, Rayeneh has continuously strived to reach new markets while offering world class services. As of today, Rayeneh Group operate international offices in our territory with unique access to sources of high-quality chemicals, and is one of major players in the chemicals market. As dictated by our policy, "Serving Our Clients Beyond Their requirements" has always been at the forefront of our operations.*

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