PTA TECHNOLOGY

PTA (Purified Terephthalic Acid)
Terephthalic acid is the organic compound with formula \( \text{C}_6\text{H}_4(\text{COOH})_2 \). This colorless solid is a commodity chemical, used principally as a precursor to the polyester PET, used to make clothing and plastic bottles. Approximately 60 million tonnes are produced annually in the world.

Introduction
MCC has developed an advanced PTA technology with high yield and low solvent and energy consumption. MCC PTA product grade is considered one of the best in the world. MCC has in total, nine (9) operating plants in Korea, Indonesia, India and China. MCC has two (2) license plants in Iran and Poland. MCC largest operating PTA plant capacity is 800KTA and is located in India.

Global Operation of PTA Business

![Map showing Mitsubishi Chemical's PTA production capacity globally as of 2013.](image-url)
# Technology Development History

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- **1963-1974**: MCC-PTA Start
- **1974-1985**: Developing the New Technology
- **1977-1999**: Construction based on MCC-K Technology
- **1987-1999**: Development of New PTA Technology
- **1990**: Start Globalization of MCC’s Technology
- **1995-2000**: Capacity Up by adopting the new Technology
- **1997-2003**: MCC PTA Mother Plant as World Scale
- **2000-2009**: Introducing the New Technology in addition to 2nd Generation
- **2004**: Licensing MCC PTA Technology to NPC
- **2007**: Introducing the New Technology in addition to 3rd Generation
- **2010**: Licensing MCC PTA Technology to PKN
Technology Feature
MCC PTA technology features are as follows
(1) Process Features

1. Process for PTA Producer

2. Process Technology
   (1) World Class Scale -- Up to 1,200KTA
   (2) Highly Integrated Process
   (3) Sophisticated Reaction Technology
       High yield of PTA from Para-xylene
       Excellent Acetic acid and Catalyst consumption
       Long PTA Catalyst Life (2 years more)
   (4) High Performance Catalyst Recovery Unit
   (5) Excellent Energy Saving
   (6) Environment Friendly Process

3. Operation
   (1) Reliable and Stable Operation
       Know-how of Half Century Operation
   (2) Excellent and Stable Product Quality

(2) Product Quality Features

Stable and Excellent PTA Quality
   (1) Excellent Quality for All PTA Application
   (2) Excellent Transparency, 4CBA, Metal content, p-TA, Powder b and All Other Quality Index

Foreign Matter (FM) Control in PTA
   (1) In-process PTA Filter and other know-how
   (2) Lower FM is one of Key Factor for Long Polymer Filter-life & High Performance in PET Production
       1) High speed Spinning Operation; >6000m/min.
       2) Extra fine application; <0.1d/f
       3) Cleanness of PET Resin for Bottle Application
Process Chemistry

(1) 1st Step : CTA Process

\[ \text{p-Xylene} + 3\text{O}_2 \rightarrow \text{Crude TPA(CTA)} \]

\[ \text{HOOC-} + \text{HOOC-} + 2\text{H}_2\text{O} \]

4-Carboxyl Benzaldehyde(4CBA)

(2) 2nd Step : PTA Process

\[ \text{HOOC-CHO} + 2\text{H}_2 \rightarrow \text{p-Toluic Acid(PTA)} \]

\[ \text{HOOC-}+\text{HOOC-} + \text{H}_2\text{O} \]

4-Carboxyl Benzaldehyde(4CBA)