

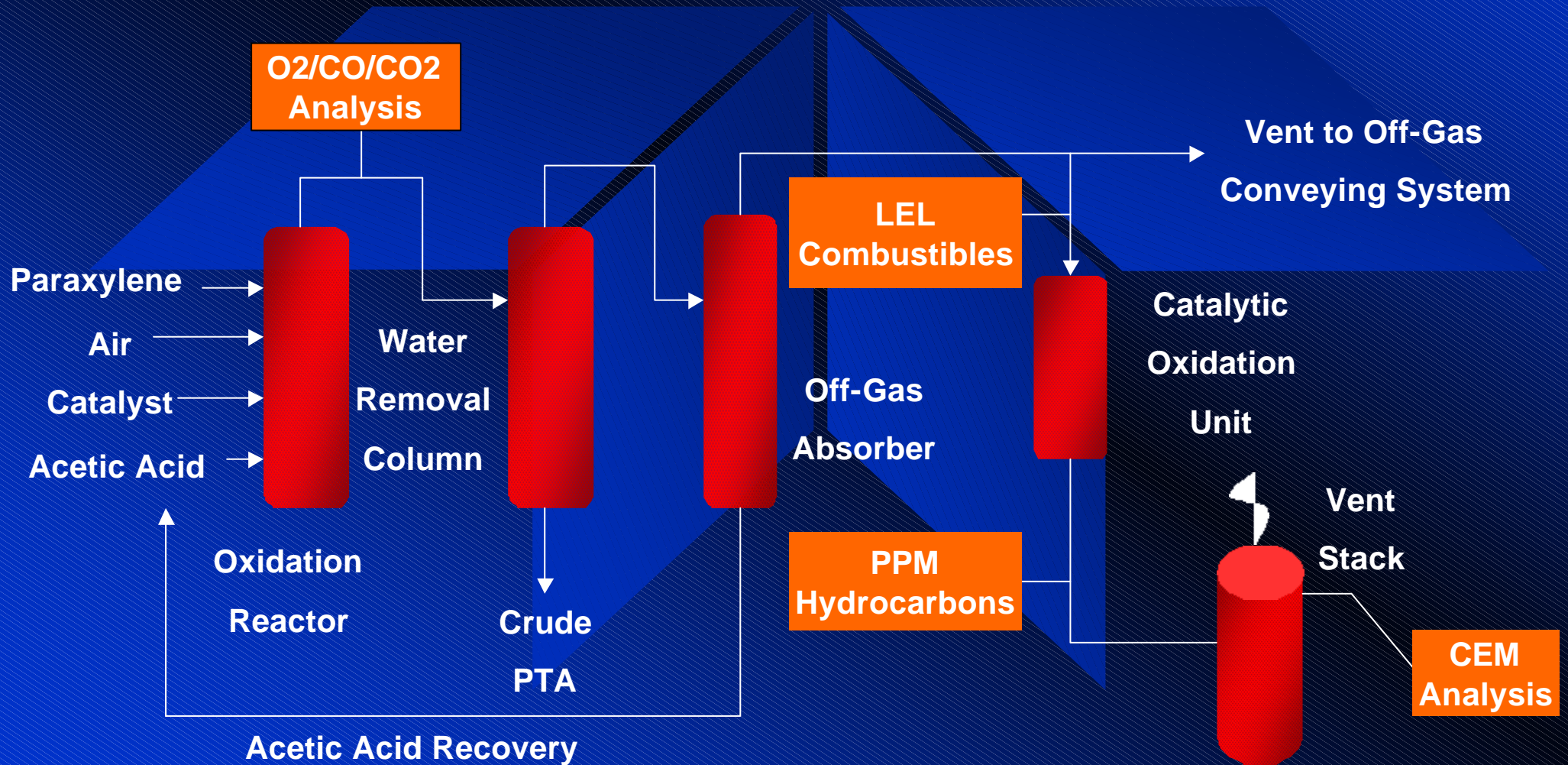
Teledyne Analytical Instruments

Application Overview

Pure Terephthalic Acid / Dimethyl Terephthalate

(PTA / DMT)

PTA PROCESS FLOW DIAGRAM



PTA PROCESS

- *(Please note that the process flow diagram offers a very simplified overview of the PTA / DMT manufacturing process. Several steps have been omitted for the sake of clarity).*
- Paraxylene is oxidized to crude terephthalic acid in an aerated acetic acid / water / catalyst solution in an oxidation reactor.
- The corrosive, high temperature / high pressure gas from the oxidizer reactor is cooled via a heat exchanger and the desired product separated out.
- Acetic Acid is recovered and recycled as a feedstock
- The vent gas from the Acetic Acid Off-Gas Absorber is routed to a Catalytic Oxidation Unit where the unburned hydrocarbons are reduced to acceptable levels prior to venting to atmosphere.

TELEDYNE OPPORTUNITIES WITHIN A PTA PLANT

- **Oxidation Reactor**: Need to continuously detect and control %O₂ between 3-6% for reaction and safety (explosion prevention) purposes. A back-up O₂ analyzer is typically required.
 - **Model 3020P** (using CO₂ resistive electrochemical cell) or
 - **Model 3020M** (using Paramagnetic O₂ detector)
 - There is also a need to detect CO and % CO₂ as a means to ensure the desired reaction is taking place within the oxidizer.
 - **Series 7000** NDIR Analyzer for both CO & CO₂
- **NOTE**: The composition of the oxidizer vent gas is corrosive (ie H₂O, acetic acid, methyl acetate, bromides) so the sample gas must be properly preconditioned prior to analysis to ensure accurate results are achieved.

TELEDYNE OPPORTUNITIES WITHIN A PTA PLANT

- **ACETIC ACID RECOVERY**: There is often times a need to detect the amount of H₂O(liquid) found in the recycled acetic acid feed.
 - **Series 500** Near Infrared H₂O Analysis System
- **CATALYTIC OXIDATION UNIT (COU)**: This is a plant option typically applied on the **AMOCO** PTA process. The hydrocarbons remaining in the vent gas are oxidized to meet environmental regulations.
 - **Model 102 or 177** : 0-100% LEL monitoring of the feed stream
 - **Model 402REU** : PPM THC's (to determine efficiency of COU)
 - **CEM** Stack Gas Analysis (O₂/NO_X/Stack Velocity)
- **STORAGE SILO**: There is a need to detect %O₂ in the N₂ used in the pneumatic conveying system & silo headspace to prevent auto-ignition / explosive conditions and to preserve product quality.

WHY CHOOSE TELEDYNE?

- Our ability to provide **complete, specially customer-tailored systems** for all applications previously discussed with competitive pricing
- Ability to provide either **electrochemical** or **paramagnetic** O₂ analyzers for the pivotal %O₂ analysis (user preference).
- **PROVEN TRACK RECORD:**
 - AMOCO Chemical Belgium No.2 PTA HP Vent Facility
 - Samnam Petrochemical Co. Ltd, Ulsan, Korea (No.2 & 3)
 - Sunkyong Fibers Co. Ltd, Ulsan, Korea
 - China American Petrochemical Co Ltd (CAPCO), Kaoshiung (Units 1-4)
 - Mitsubishi Kasei Corporation, Yokkaichi, Japan
 - PT. Polysindo, Indonesia