A. **Absorbent** Tower (Packed Bed, Spray Tower, Wet Scrubber)
- **Dissolution** of the pollutant gas to the surface of the liquid
- **Dissolution** across the gas/liquid interface (dissolution)
- **Dissolution** of the dissolved gas away from the interface into the liquid:
  \[ P = H C_i \]
  where: \( P \) = equilibrium partial pressure of gas, kPa, \( H \) = Henry's law constant, kPa·m³/g
  and \( C_i \) = concentration of pollutant gas in liquid phase, g/m³
- want to maximize gas liquid contact by maximizing surface area
- efficiency will be limited by the solubility of the pollutant

B. **Baghouse**
- same principle as the home \( v \) **Bags**
- bags are cleaned periodically as the \( d \) **Dirt** across the bag becomes excessive (approximately every 2 hours)
  - cleaned by mechanical \( r \) **Ribs** (used for shake-deflate design)
  - cleaned by \( h \) **Airjets** (used for pulse jet design)
- must be a \( d \) **Dust** gas stream
- potential \( f \) **Fire** hazard
- bag "\( r \) **Rags**" with time - develops a fine mat which helps to screen out particles
- for \( p \) **Flue Gas** removal, or used in conjunction with F **Flue Gas** D **Dust** applications

C. **Cyclone** Separator
- used for particulates larger than \( \mu \) **Micrometer**
- gas stream is accelerated through a \( s \) **Sidewalls** \( m \) **Motor**, centrifugal force moves heavier particles out and down
- as the \( d \) **Diameter** of the cyclone is reduced, the efficiency increases (as does the pressure drop)
- use of \( m \) **Multiple** tubes in parallel (multiclones) improves efficiency

D. **Adsorption** Bed
- surface \( p \) **Porosity** or \( c \) **Chemisorption** bond with the surface
- adsorbents: activated \( c \) **Carbon**, activated \( a \) **Alumina**, silica gel, and others
- 1 ounce of activated carbon has a surface area of \( \mu \) **Micrometer** acres
- bed must be \( r \) **Rinsed** prior to breakthrough

E. **Electrostatic Precipitator (ESP)**
- \( w \) **Wiring** in \( t \) **Tape** or wire and \( p \) **Piping** configurations
- wet or dry, wet cleaned by \( w \) **Washing**, dry by rapping, can be cleaned while in service
- \( c \) **Copper** wire imparts an electrical charge (neg), particles are attracted to charged (pos) collecting plates
- high \( p \) **Pressure** removal efficiencies possible

F. **Venturi Scrubber**
- velocity of gas is \( a \) **Accelerated** by a factor of four in the throat section where nozzles inject water or solution
- high velocity causes a \( a \) **Aerosol** of liquid
- pressure drop following the \( t \) **Throat** section creates a lot of turbulence resulting in good intermixing
- requires \( s \) **Separator** (e.g., cyclone) following venturi to collect particles and liquid

G. **Thermal Incineration**