

# Water in Industry

Water is typically used:

- As a cleaning agent
- For heat transfer
- As a solvent
- As a reagent
- As a suspension agent

- V high specific heat
- V high latent heat of vaporisation
- Negative coefficient of expansion in the temperature range 4 to 0°C
- Relatively inert
- Virtually incompressible
- Universal polar solvent

## Properties that make water an ideal cleaning agent

- non-toxic
- non-flammable
- low viscosity
- has a low vapour pressure at ambient temperatures
- will evaporate in air at ambient temperatures
- powerful polar solvent

# Water as a Heat Transfer Agent

## 1 High Specific Heat.

Water 4.19 kJ per kg per °C

Ethyl Alcohol 2.85 kJ per kg per °C

Gasoline 2.22 kJ per kg per °C

## 2 High Latent Heat of Vaporisation

Water 2251 kJ per kg

Ethyl Alcohol 855 kJ per kg

Ammonia 1187 kJ per kg

## 3 Safe

It is non-flammable and non-toxic

## 4 Low viscosity

makes it easy to pump around

# Water as a solvent

- As a carrier agent e.g. in the dyeing industry
- In solution mining for minerals such as rock salt
- Crude oil primary purification

# Water as a reagent

- Hydrogenation to generate Methanol/Ethanol
- Setting cement

# Water as a suspension agent

- China clay
- Coal slurry
- Root vegetables



# Ultrapure water

- In power generation
- In the electronic industry