Ion Exchange Design & Operation

Aquasolve College of Science & Technology (ACST)

Programme Overview

Duration: 5 days (40 hours)
Level: Specialist
Focus: Water softening, demineralisation, and mixed-bed DI systems

Ion Exchange Fundamentals

- Cation vs anion exchange
- Strong acid cation (SAC) and weak acid cation (WAC) resins
- Strong base anion (SBA) and weak base anion (WBA) resins
- Exchange capacity and breakthrough
- Regeneration chemistry

Water Softening

- Hardness removal: Ca^{2+} and Mg^{2+} exchange
- Sodium cycle softening
- Regeneration with NaCl brine
- Salt dosing calculations
- Softener sizing for flow and hardness

Demineralisation Systems

- Two-bed demineralisation: cation + anion
- Mixed-bed polishing
- Conductivity and resistivity monitoring
- Regeneration sequencing
- Rinse water quality and waste minimisation

Electrodeionisation (EDI)

- EDI principles and configuration
- Comparison: IX vs EDI
- When to specify EDI
- Maintenance requirements
- Cost-benefit analysis

Troubleshooting & Optimisation

- Resin fouling: iron, organics, silica
- Channeling and resin attrition

- Poor regeneration efficiency
- Premature breakthrough
- Case studies from Ghanaian industrial applications

Certification & Fee

ACST Ion Exchange Specialist Certificate. Fee: GHS 4,200 per participant. Contact: demlom@aquasolvewater.com (Technical) or victoria@aquasolvewater.com (Registration).