

FERTIGATION TECHNOLOGY

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What are fertigation techniques? 'Fertigation' is the technique of supplying dissolved fertiliser to crops through an irrigation system. When combined with an efficient irrigation system both nutrients and water can be manipulated and managed to obtain the maximum possible yield of marketable production from a given quantity of these inputs.

What are the disadvantages of fertigation? Following are some disadvantages that fertigation can pose: Uneven distribution of nutrients occurs when there are faults in the irrigation system. This can lead to nutrients leaking when excess water is applied to crops. Wastage of fertilisers due to leaking can lead to soil and water pollution.

What are the devices used in fertigation? A centrifugal pump is used to inject the solution into the supply line. The pump can also be used to re-circulate water to agitate and dissolve the fertiliser. Many fertigation systems use a separate pump for this or have an impeller driven by an electric motor.

What is fertigation modern technique of fertilizer application? Fertigation technology suggests sprinkling fertilizers into the precision irrigation system from reservoirs with water-soluble fertilizers. Typically, it is done with injectors and a pressure-controlled valve. Most fertigation systems are equipped with sensors to measure pH levels and electric conductivity.

Which fertilizer is not suitable for fertigation? Urea, potash and highly water soluble fertilizers are available for applying through fertigation. Application of super phosphorus through fertigation must be avoided as it makes precipitation of phosphate salts.

How effective is fertigation? Fertigation? Drip system is the most adopted and effective way of fertigation for efficient use of fertilizer and irrigation water. Fertigation remarkably improves fertilizer and water use efficiency and with higher crop yield and quality.

Is fertigation the same as irrigation? Unlike traditional irrigation, which can be less efficient and more labour-intensive, fertigation leverages drip or sprinkler systems to evenly distribute water and nutrients evenly, making it an economically and environmentally superior choice.

What are the environmental impacts of fertigation? With fertilization nitrogen-oxide, a greenhouse gas, can escape into the atmosphere, nitrates can leach into the groundwater, surface runoff water from the fields can transports phosphorus, ammonia and nitrate to water reservoirs and rivers [1] .

What is dolloping in agriculture? There are different ways of applying fertiliser, but in countries such as Zimbabwe and Malawi 'dolloping' is the preferred method. It's one of the most precise methods for emerging farmers. Dolloping involves using dollop cups, which are readily available in those countries.

Is fertigation the same as irrigation? Introduction to Fertigation Unlike traditional irrigation, which can be less efficient and more labour-intensive, fertigation leverages drip or sprinkler systems to evenly distribute water and nutrients evenly, making it an economically and environmentally superior choice.

How do fertigation systems work? Fertigation is the application of fertilizers or nutrients into a farming system via the irrigation network, wherein the nutritious inputs are dissolved into water and then absorbed directly by plants when they uptake water.

What are the techniques of fertigation in greenhouse? Fertigation is the injection of fertilizers through the irrigation system. Micro-irrigation systems are well-suited to fertigation because of their frequency of operation and because water application can be easily controlled by the grower, but it can also be done with ebb-and-flow and trough bench systems.

How do you make fertigation?

How to learn Python step by step for beginners?

How to write Python program step by step?

How do I start my first Python program?

How can a beginner practice Python?

Can I self teach myself Python? Yes, it's absolutely possible to learn Python on your own. Although it might affect the amount of time you need to take to learn Python, there are plenty of free online courses, video tips, and other interactive resources to help anyone learn to program with Python.

Can a beginner directly learn Python? Yes. Python is a great language for programming beginners because you don't need prior experience with code to pick it up. Dataquest helps students with no coding experience get jobs as data analysts, data scientists, and data engineers.

How do I begin with Python?

Where to write Python code for beginners? Good to know In this tutorial Python will be written in a text editor. It is possible to write Python in an Integrated Development Environment, such as Thonny, Pycharm, Netbeans or Eclipse which are particularly useful when managing larger collections of Python files.

How to learn coding for beginners?

How to say hello world in Python? Using Print() - The Pythonic Way print("Hello, World!") The print() function is foundational, and mastering it will serve you well in your Python journey. It accepts one or more arguments, making it versatile enough to display strings, variables, or even complex expressions as output.

How do you get the first entry in Python? To access the first and last elements of a list in Python, you can use simple indexing. The first element is indexed at 0 , and the last element can be accessed with index -1 .

How do I run a Python program for beginners?

Where can I teach myself Python? Codecademy's Learn Python 2 You'll learn Python syntax, strings and console output, conditionals and control flow, functions, lists and dictionaries, lists and functions, and loops. Students complete projects, including real-world applications.

How difficult is Python for beginners? Python is widely considered among the easiest programming languages for beginners to learn. If you're interested in learning a programming language, Python is a good place to start. It's also one of the most widely used.

What should I do first to learn Python?

Which Python course is best for beginners?

Which is the best YouTube channel to learn Python?

Can Python alone get you a job? No, Python alone is not enough to get a job, but knowing python basics and other soft skills and a good educational background certainly help you.

How to begin with Python? Python Quickstart Let's write our first Python file, called helloworld.py, which can be done in any text editor. `print("Hello, World!")` The output should read: Hello, World!

How can I practice Python as a beginner?

Can I earn money as a beginner in Python? Yes, it is possible to make money by only knowing Python, as there are many job opportunities available for Python developers. Python is a versatile and widely-used programming language, and there is high demand for developers who know how to work with it.

How many hours a day to learn Python? To learn the very basics of Python, 2 hours per day for two weeks can be enough. Considering it takes 500+ hours to reach a somewhat advanced level, though, you'll have to study Python for 4 hours per day for 5 months to get there.

Which is the best website to learn Python?

How to practice coding every day?

What should I do first to learn Python?

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Can I learn Python in 30 days? Recommended for everybody. The 30 Days of Python conveys the basics of Python in a very simple way and each day isn't very time consuming. It is a general course, so covers things that you'd need in most Python projects, such as working with data, doing research, or data analysis.

Which Python course is best for beginners?

What is Python good for beginners? Due to its simplicity, it is simple to learn and comprehend, making it an excellent choice for beginners. Python can be used for several tasks because it is a flexible language, including web development, game development, machine learning, and artificial intelligence.

How to learn coding for beginners?

How to practice coding every day?

How to start Python for beginners?

Is Python enough to get a job? Python alone isn't going to get you a job unless you are extremely good at it. Not that you shouldn't learn it: it's a great skill to have since python can pretty much do anything and coding it is fast and easy. It's also a great first programming language according to lots of programmers.

Is Python easier than Java? Read on to discover which language might be best for you to start learning. Java and Python are two of the most popular programming languages. Of the two, Java is the faster language, but Python is simpler and easier to learn. Each is well-established, platform-independent, and part of a large, supportive community.

Can I Learn Python on my own? Yes. But you need a goal. If you just want to learn python you will do the exercises in the book/video and will think you learned. After learning the basics, try and build a project.

Which YouTube channel is best to learn Python?

How long does it realistically take to learn Python? In general, it takes around two to six months to learn the fundamentals of Python. But you can learn enough to write your first short program in a matter of minutes. Developing mastery of Python's vast array of libraries can take months or years.

What should I learn first before Python? HTML & CSS Python programming is essential for both development and data science. If you plan to use Python in a development role, consider getting some HTML and CSS basics under your belt first. Whereas Python is relevant in back end development, HTML and CSS are both essential to front end development.

How difficult is Python for beginners? Is Python Hard to Learn? As one of the easiest programming languages, Python is super beginner friendly and a great coding language to jumpstart a new career path. With a syntax similar to English, Python is easy to read and understand, making it perfect for anyone new to writing code.

Where to practice Python for beginners?

Solution Manual: Fiber Optic Communication Systems by Agrawal

The solution manual for "Fiber Optic Communication Systems" by Govind P. Agrawal provides detailed explanations and step-by-step solutions to the end-of-chapter problems in the textbook. It is an invaluable resource for students and researchers in the field of fiber optics who need assistance with understanding the concepts and applying them to solve problems.

Question 1: What is the power loss in a fiber optic cable with a core radius of 50 μ m and a length of 100 km? The fiber has a refractive index of 1.44 and an attenuation coefficient of 0.2 dB/km.

Solution:

$$\text{Power loss} = (\alpha L) \text{ dB}$$

$$\alpha = 0.2 \text{ dB/km}$$

$$L = 100 \text{ km}$$

$$\begin{aligned} \text{Power loss} &= (0.2 \text{ dB/km})(100 \text{ km}) \\ &= 20 \text{ dB} \end{aligned}$$

Question 2: Calculate the numerical aperture of a single-mode fiber with a core diameter of 8 μm and a cladding diameter of 125 μm .

Solution:

$$NA = \sqrt{(n_1^2 - n_2^2)}$$

$$n_1 = 1.46$$

$$n_2 = 1.44$$

$$\begin{aligned} NA &= \sqrt{(1.46^2 - 1.44^2)} \\ &= 0.14 \end{aligned}$$

Question 3: Explain the difference between step-index and graded-index multimode fibers.

Solution:

- **Step-index fiber:** The refractive index is constant across the core.
- **Graded-index fiber:** The refractive index gradually decreases from the center of the core to the cladding.

Graded-index fibers reduce modal dispersion by allowing light rays to travel with different speeds depending on their angle of incidence. This results in higher bandwidth and lower signal loss compared to step-index fibers.

Question 4: What is the bit rate of a fiber optic communication system that uses a laser with a wavelength of 1550 nm and a modulation frequency of 2.5 GHz?

Solution:

$$\text{Bit rate} = 2B$$

$$B = \text{Modulation frequency}$$

$$= 2(2.5 \text{ GHz})$$

$$= 5 \text{ Gbps}$$

Question 5: Describe the operation of an optical amplifier.

Solution:

Optical amplifiers provide gain to optical signals without converting them to electrical signals. They are based on stimulated emission and work by injecting a pump light into the fiber, which excites the atoms in the fiber to higher energy levels. When the signal light enters the fiber, it interacts with the excited atoms and stimulates them to emit photons of the same wavelength as the signal light, resulting in amplification.

What is the process of desalting crude oil? Crude oil to be desalted is heated to a temperature of 100-150 °C and mixed with 4-10% fresh water, which dilutes the salt. The mixture is then pumped into a settling tank where the salt water separates from the oil and is drawn off.

What is the process of electrostatic Desalting? Therefore, electrostatic desalting is one of the most popular methods to remove saline water from crude oil by applying an external electrostatic field. This increases the rate of collision of water droplets thereby improving the coalescence.

What is the process of processing crude oil? The crude is heated by a furnace and is sent to a distillation tower, where it is separated by boiling point. Then the material is converted by heating, pressure or a catalyst into finished products including fuels like gasoline and diesel, and specialty products like asphalt and solvents.

What are the three stages of desalting process? The three stages of desalting are: adding dilution water to crude; mixing dilution water with crude by a mixer; dehydration of crude in a settling tank to separate crude and sediment and water (S&W).

How does electric desalter work? Desalter transformer working principle In crude oil-water emulsion water mixed with salt content is an electrically conductive liquid and oil is non-conductive. When 15000-16500 volts of current passes through oil-water emulsion water droplets begin to accumulate and separate from the oil-water

interface.

What is the principle of Desalting? Desalting occurs when buffer salts and other small molecules are removed from a sample in exchange for water (with the resin being pre-equilibrated in water). Buffer exchange occurs when the buffer salts in a sample are exchanged for those in another buffer.

What is the process of an electrostatic filtering system? The electrostatic filter itself has a charge opposite to the charge given to the particles. This causes the charged particles to be attracted to the inside of the filter, holding them there until they're removed.

What is the mechanism of electrostatic filtration? In the collection section, positively charged metal plates or fins repel the positively charged particles, and alternating grounded fins attract the positively charged particles. Contaminants remain trapped on the grounded fins until the collector cell is washed.

What are the disadvantages of electrostatic separation? One of the main disadvantages of electrostatic separation is that it requires a high degree of control and calibration of the electric field and the feed characteristics. Any variation in the voltage, humidity, temperature, or composition of the feed can affect the separation performance and quality.

How is crude oil made step by step? This process begins with the accumulation of organic matter, such as dead plants and animals, on the bottom of ancient oceans and lakes. Over time, the organic matter is buried and subjected to high pressure and heat, which cause chemical reactions to take place and transform the organic matter into crude oil.

What are 5 basic refining processes?

What are the three stages of crude oil?

What are the steps in the crude oil desalting process? The process comprises, consists essentially of, or consists of, the steps of: (1) combining a steam with a fluid to form a first mixture in which the fluid comprises a hydrocarbon, such as a crude oil, and a salt; (2) introducing water into the first mixture to form a second mixture; and (3) separating the hydrocarbon ...

What are the different types of Desalters? Desalters typically come in two main types: electrostatic coalescers and chemical desalters. Electrostatic coalescers use an electrical field to promote the coalescence of water droplets, facilitating their separation from the oil.

What is the pressure control on a Desalter? The Desalter interface levels are controlled by regulating the amount of salt water (or brine) withdrawn from the bottom. The 1st Stage Desalter pressure is maintained at 14 barg (200 psig) by a pressure controller that adjusts the speed of the Crude Feed Pump.

What is electrostatic desalter? Electrostatic desalters are essentially gravity separation devices governed by Stokes law so coalescing drops to form larger drops that settle more rapidly is a key to operational efficiency.

What is crude desalter? Crude desalters perform an important role in the initial oil separation and cleaning process by removing salts that can cause significant corrosion damage to downstream processing equipment if left in the process fluid.

What is the typical salt content of crude oil at the outlet of desalter? The outlet crude oil from the electrostatic desalter should meet the required specifications and the BS&W and salt content or crude should be less than 0.1–0.2 vol. % and 28 g/m³, respectively (Manning and Thompson, 1995).

What is the process of electric desalting? In Electrical desalting is the application of high-voltage AC or DC electric fields to concentrate suspended water globules at the bottom of the settling tank. Electric potentials from 12,000 to 35,000 volts are used to promote coalescence. Surfactants are added if the crude has a large amount of suspended solids.

What is the process of desalting? The most common desalination processes are distillation and reverse osmosis. There are several methods. Each has advantages and disadvantages but all are useful. The methods can be divided into membrane-based (e.g., reverse osmosis) and thermal-based (e.g., multistage flash distillation) methods.

How is salt removed from crude oil? To remove the salt and the water, crude oil undergoes a step known as desalting. In this step the crude oil undergoes an initial

dilution with the addition of clean water. The new diluted mixture is then emulsified so that the salty water initially present in the crude oil comes into contact with the clean water.

What is the process of Desulfurization of crude oil? Desulfurization is the process of removing sulfur from crude oil (or its fractions). It prevents contamination and also improves the efficiency of petroleum. Desulfurization removes elemental sulfur and its compounds from solids, liquids and gases.

How is water removed from crude oil? At the production facility, the bulk of the water with dissolved salts is removed from the crude oil by gravity separation (i.e., settling) or by centrifuging. The emulsion might also be heated to 35-80° C. to facilitate water separation.

How is salt removed from crude oil? To remove the salt and the water, crude oil undergoes a step known as desalting. In this step the crude oil undergoes an initial dilution with the addition of clean water. The new diluted mixture is then emulsified so that the salty water initially present in the crude oil comes into contact with the clean water.

What is the dewaxing process of crude oil? Dewaxing is carried out by chilling the oil up to 10-15°C into the crystallizers. Chilling plant is responsible for the low temperature achievement. The crystallizers are equipped with agitation mechanism which is controlled by variable drive so as to have a controlled system and not to break the formed crystals.

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FERTIGATION TECHNOLOGY

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