

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

Week 4

- Lecture 16 : Material Balance of Recycle & Bypass Units

- Lecture 17 : Material Balance of Recycle & Bypass Units (Contd.)

- Lecture 18 : Introduction

- Lecture 19 : Introduction (Contd.)

- Lecture 20 : Introduction (Contd.)

- Week 4 Lecture Material

- Quiz: Week 4 : Assignment 4

- Week 4 Feedback Form

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

Download Videos

Detailed Assignment Solution

Live Interactive session

Week 4 : Assignment 4

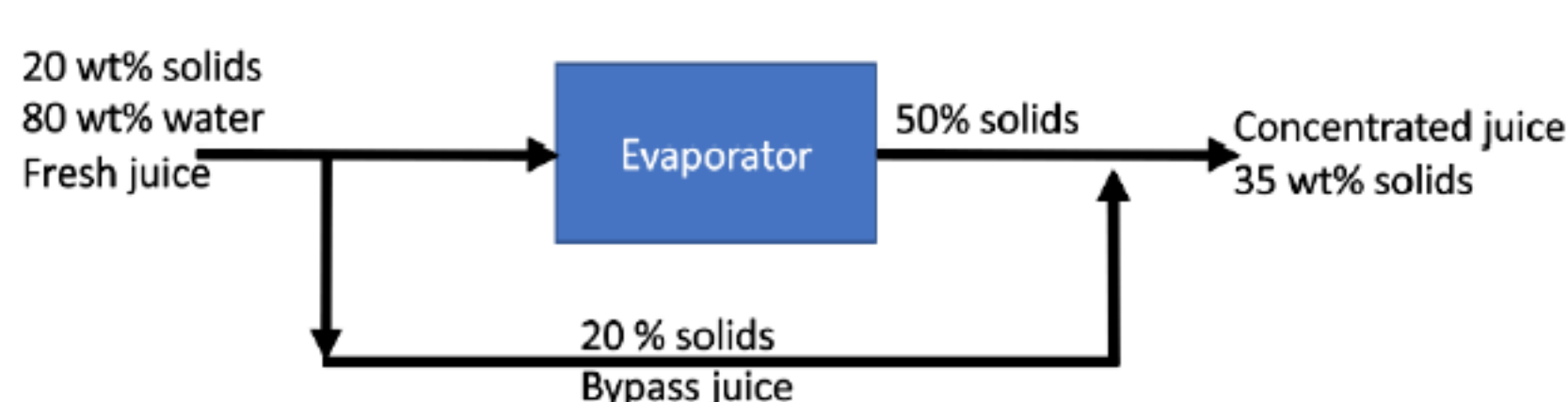
The due date for submitting this assignment has passed.

Due on 2021-09-01, 23:59 IST.

As per our records you have not submitted this assignment.

Question 01 & 02:

Given below is a process flow chart to concentrate the solids present in fresh lime juice using an evaporator:



1) From the above flow chart, calculate the percentage of fresh juice that is bypassing the evaporator.

2 points

- (a) 18.34 %
 (b) 28.57 %
 (c) 21.07 %
 (d) 33.84 %

- a)
 b)
 c)
 d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

b)

2) From the above flow chart, calculate the amount of concentrated juice produced in kg per 100 kg of fresh juice fed into the evaporator.

2 points

- (a) 17.29 kg
 (b) 33.84 kg
 (c) 28.57 kg
 (d) 57.14 kg

- a)
 b)
 c)
 d)

No, the answer is incorrect.

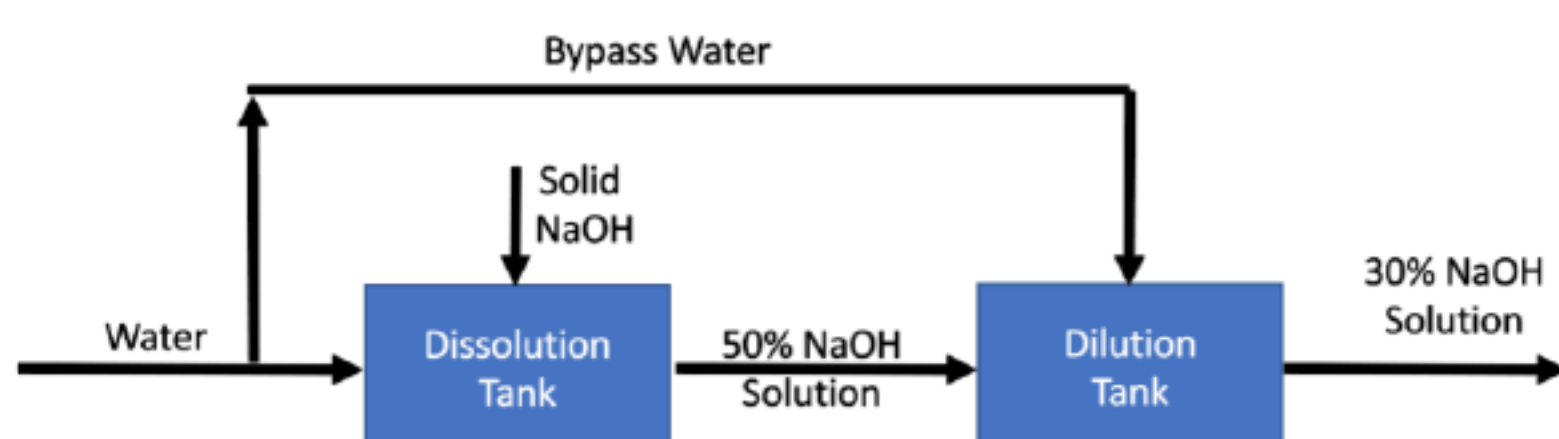
Score: 0

Accepted Answers:

d)

Question 03 & 04:

Given below is a process flow chart to prepare 30% NaOH solution by using solid NaOH and water. Assume there is no loss of water in the dissolution tank:



3) From the above flow chart, calculate the amount of water present in 30% NaOH solution per 100 kg of solid NaOH charged into the dissolution tank.

2 points

- (a) 222.22 kg
 (b) 266.66 kg
 (c) 233.33 kg
 (d) 433.33 kg

- a)
 b)
 c)
 d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

c)

4) From the above flow chart, calculate the ratio of water fed to dissolution tank to water bypassed to dilution tank.

2 points

- (a) 0.40
 (b) 2.50
 (c) 0.75
 (d) 1.33

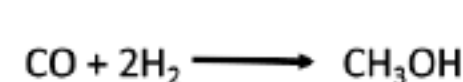
- a)
 b)
 c)
 d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

c)

Question 05, 06 & 07:Methanol is produced in a reactor using CO and H₂ according to the following reaction:5) Calculate the stoichiometric ratio of CO to H₂.

2 points

- (a) 0.5
 (b) 1.0
 (c) 1.5
 (d) 2.0

- a)
 b)
 c)
 d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

a)

6) Calculate the amount of methanol produced in kmol per 5 kmol of CO reacted.

2 points

- (a) 1 kmol
 (b) 5 kmol
 (c) 10 kmol
 (d) 2.5 kmol

- a)
 b)
 c)
 d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

b)

7) To produce 2000 kg of Methanol, calculate the amount of CO required.

2 points

- (a) 2000 kg
 (b) 875 kg
 (c) 1000 kg
 (d) 1750 kg

- a)
 b)
 c)
 d)

No, the answer is incorrect.

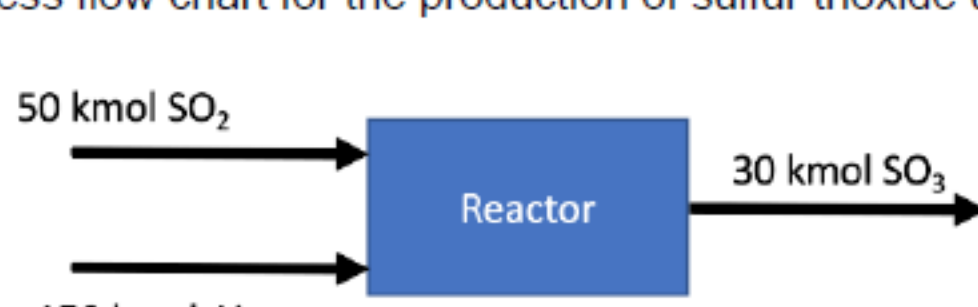
Score: 0

Accepted Answers:

d)

Question 08 & 09:

Given below is the process flow chart for the production of sulfur trioxide using sulfur dioxide:



8) Calculate the percentage conversion of sulfur dioxide.

2 points

- (a) 50%
 (b) 60%
 (c) 70%
 (d) 80%

- a)
 b)
 c)
 d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

b)

9) Calculate the percentage excess air used.

2 points

- (a) 31.5%
 (b) 35%
 (c) 28%
 (d) 50%

- a)
 b)
 c)
 d)

No, the answer is incorrect.

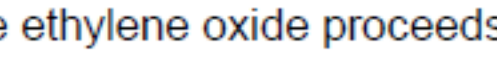
Score: 0

Accepted Answers:

c)

QUESTION 10:

The oxidation of ethylene to produce ethylene oxide proceeds according to the equation:

The feed to the reactor contains 100 kmol C₂H₄ and 200 kmol O₂

10) If the reaction proceeds to a point where the fractional conversion of the limiting reactant is 70%, how much of each reactant and product is present at the end?

2 points

- (a) 70 kmol C₂H₄, 130 kmol O₂ and 70 kmol C₂H₄O
 (b) 30 kmol C₂H₄, 130 kmol O₂ and 70 kmol C₂H₄O
 (c) 30 kmol C₂H₄, 165 kmol O₂ and 70 kmol C₂H₄O
 (d) 30 kmol C₂H₄, 165 kmol O₂ and 30 kmol C₂H₄O

- a)
 b)
 c)
 d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

c)