Assignment 6

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2018-08-11, 23:59 IST.

An aqueous solution of acetic acid (0.25M) and nitric acid (0.2M) is to be extracted with 50% di-isophyl ether in a countercurrent cascade at a rate of 2000 kg/h. A solvent ratio of 2000 kg/h is suggested. The feed solution must not contain more than 10% of acid in it. The ternary phase equilibrium data is given:

<table>
<thead>
<tr>
<th>Water layer (raffinate)</th>
<th>Ether layer (extract)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>X2</td>
</tr>
<tr>
<td>0.981</td>
<td>0.012</td>
</tr>
<tr>
<td>0.971</td>
<td>0.015</td>
</tr>
<tr>
<td>0.955</td>
<td>0.016</td>
</tr>
<tr>
<td>0.917</td>
<td>0.019</td>
</tr>
<tr>
<td>0.944</td>
<td>0.023</td>
</tr>
<tr>
<td>0.711</td>
<td>0.034</td>
</tr>
<tr>
<td>0.580</td>
<td>0.044</td>
</tr>
<tr>
<td>0.451</td>
<td>0.106</td>
</tr>
<tr>
<td>0.371</td>
<td>0.165</td>
</tr>
</tbody>
</table>

1) Determine the number of ideal stages required.

No, the answer is incorrect. Score: 0

Accepted Answer: (Type: Numeric) 6.5

2) Determine the minimum solvent rate for the job (in kg/h).

No, the answer is incorrect. Score: 0

Accepted Answer: (Type: Numeric) 2000

3) Determine the actual solvent rate to minimum solvent rate.

No, the answer is incorrect. Score: 0

Accepted Answer: (Type: Numeric) 1.47

4) Which one of the following choices is not used for both the absorption as well as the liquid-liquid extraction process?

- (A) Packed towers
- (B) Film towers
- (C) Spray towers
- (D) Helical coil column

No, the answer is incorrect. Score: 0

Accepted Answer: (Type: String) Helical coil column

5) Small value of K indicates:

- (A) Affinity for stationary phase
- (B) Affinity for mobile phase
- (C) Affinity for no phase
- (D) Affinity for entire solution

No, the answer is incorrect. Score: 0

Accepted Answer: (Type: String) Afidity for stationary phase

6) The extracting solvent and the feed passes in cascade in opposite direction in:

- (A) Single stage extraction system
- (B) Multistage ex-current extraction system
- (C) Multistage counter-current extraction system
- (D) None of these

No, the answer is incorrect. Score: 0

Accepted Answer: (Type: String) Multistage counter-current extraction system

7) Liquid liquid extraction requires:

- (A) Low surface tension and low water content
- (B) Low surface tension and high water content
- (C) High surface tension and low water content
- (D) High surface tension and high water content

No, the answer is incorrect. Score: 0

Accepted Answer: (Type: String) Low surface tension and low water content