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| AECENAR_Kopf_withWebsiteAdress.jpg |  |

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# Overview

Solvent extraction or liquid-liquid extraction is a separation technique isothermal in a heterogeneous liquid medium.

The method is based on the existence of a difference in the solubility of a substance in two immiscible liquids. The process has three steps, as shown in next figure:

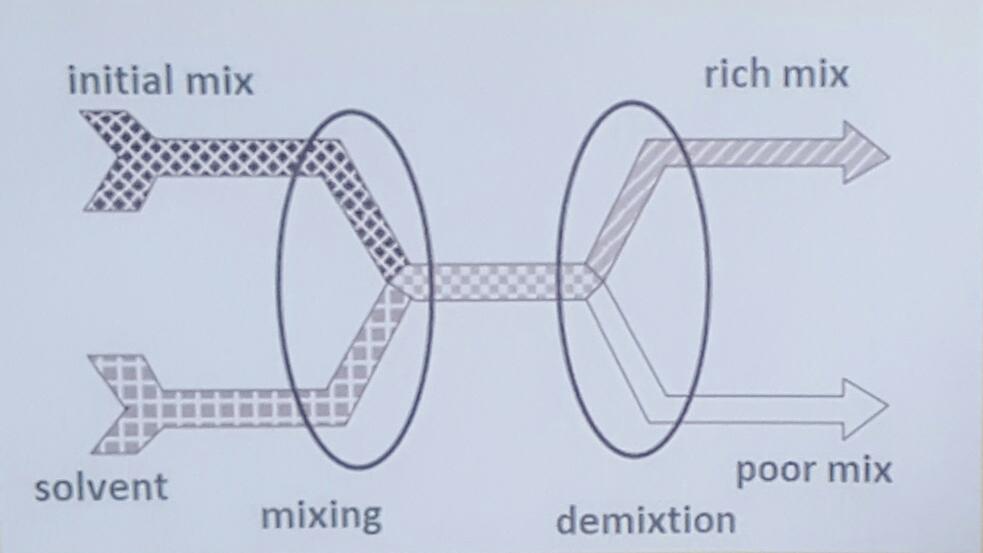
- Mixture of the two immiscible liquids, one of them containing the solute,

- Obtaining physico -chemical equilibrium, leading to demixing

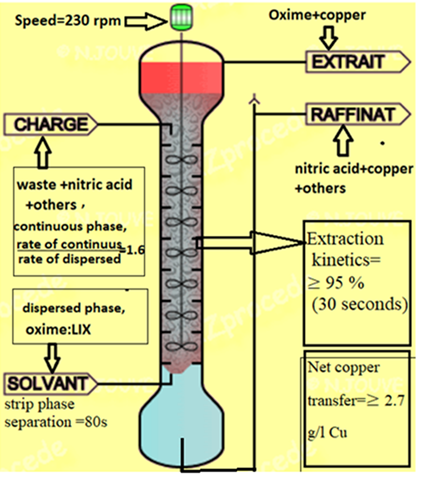
-Separation of the two new liquid phases obtained based on the difference of densities

Oxime based extractants for copper are largely based on salicyaldoximes which have been modified with one of three modifier types.

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*Figure 1: principle of a separation stage by obtaining a balance*Introduction

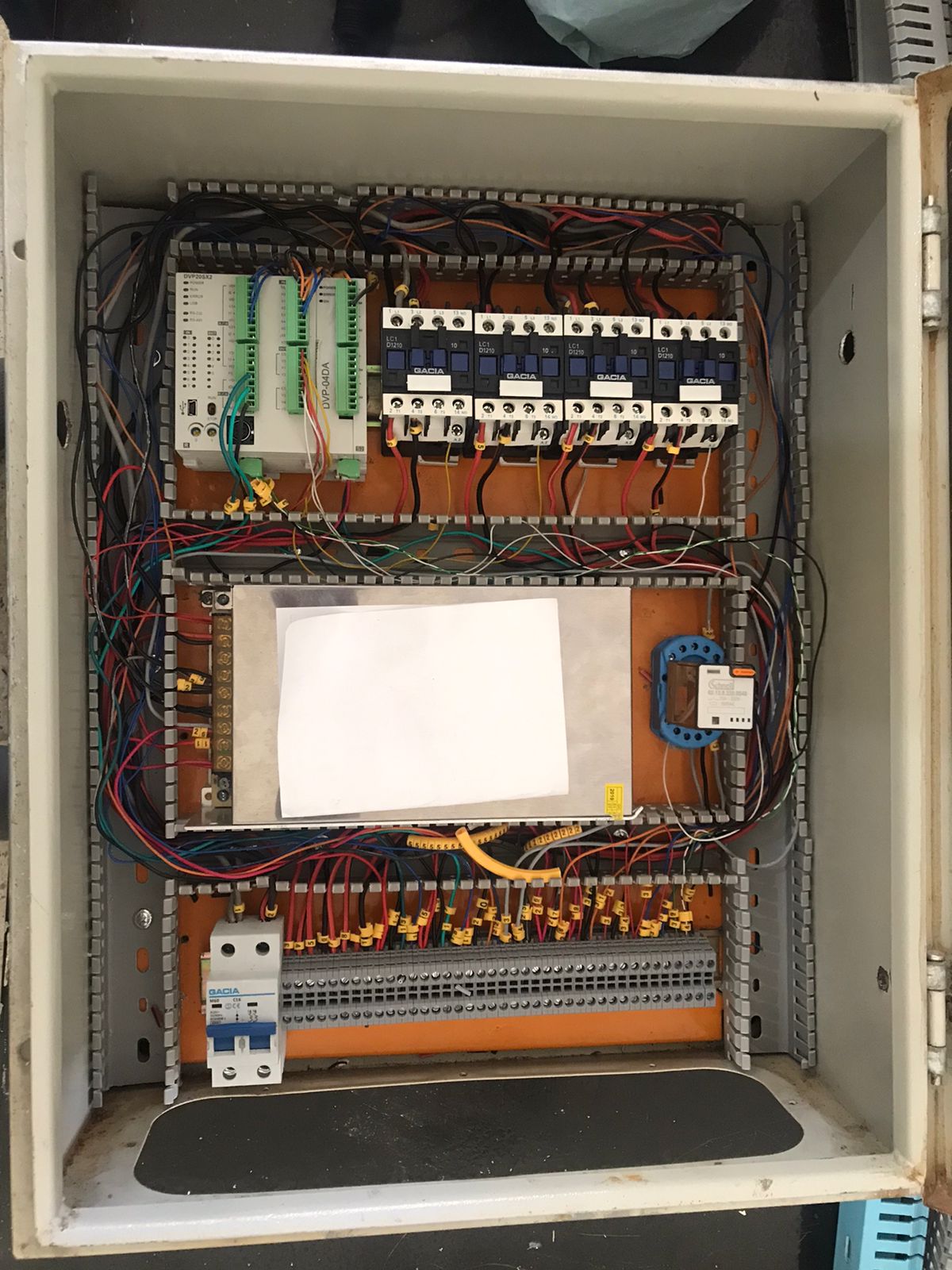
 *Figure 2:process of separation of copper*

# Pre-Starting

Please read these instructions thoroughly. This will make sure you obtain full safe use, keep this instruction manual in a handy place for future reference.

## Before using

* All valves is turned off
* Motor is turned off



Delta PLC

Contactor1 for Pump1

Contactor2 for Pump2

Contactor3 for Mixer1

Contactor4 for Mixer4

Relay for Valve4

Power supply 24V

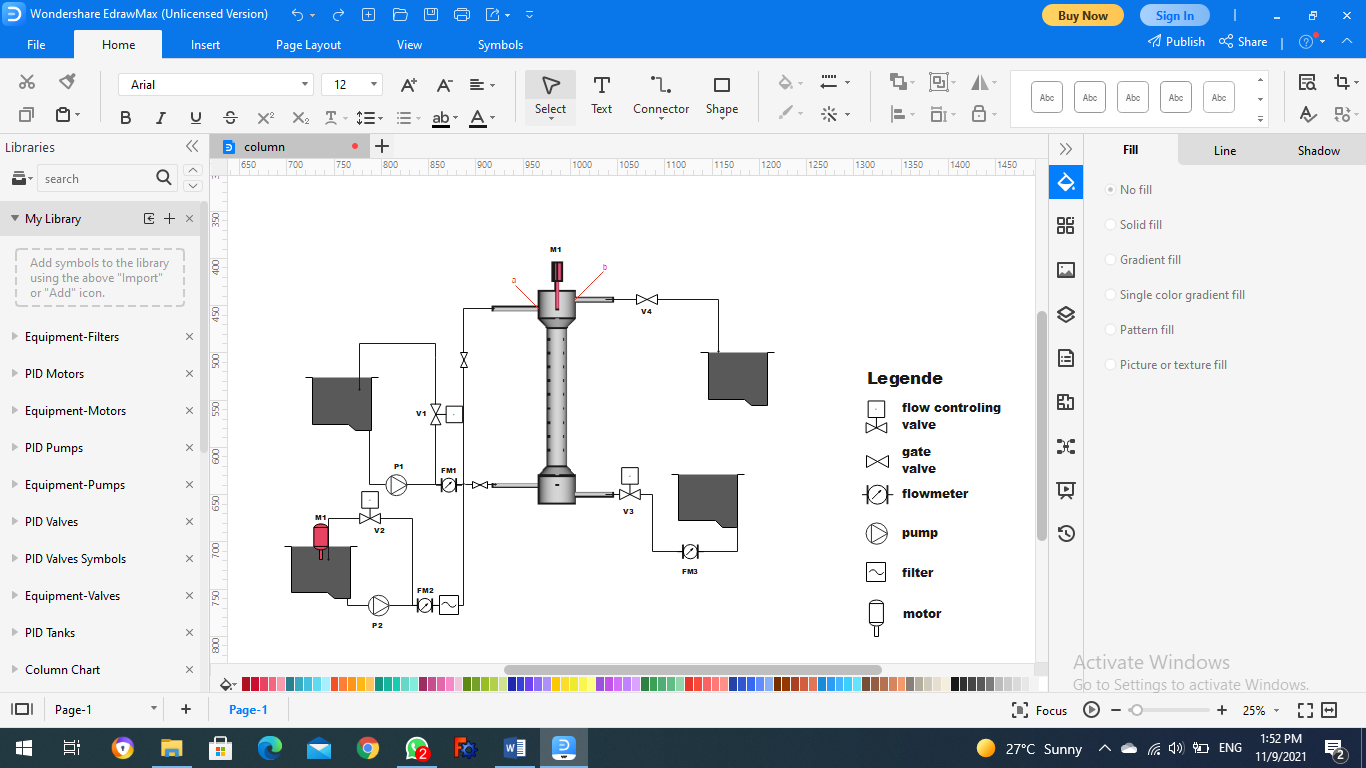
Power Breaker

Terminal Block

|  |  |
| --- | --- |
| 1-Breaker | Power - Phase |
| 2-Breaker | Power - Neutral |
| 3-Terminal Block | Pump1- Phase |
| 4-Terminal Block | Pump1- Neutral |
| 5-Terminal Block | Pump2- Phase |
| 6-Terminal Block | Pump2- Neutral |
| 7-Terminal Block | Mixer1- Phase |
| 8-Terminal Block | Mixer1- Neutral |
| 9-Terminal Block | Mixer2- Phase |
| 10-Terminal Block | Mixer2- Neutral |
| 11-Terminal Block | Valve1- 24VDC + |
| 12-Terminal Block | Valve1- 24VDC – (GND) |
| 13-Terminal Block | Valve1- Analog Command (0 to 10V) |
| 14-Terminal Block | Valve1- Feedback |
| 15-Terminal Block | Valve2- 24VDC + |
| 16-Terminal Block | Valve2- 24VDC – (GND) |
| 17-Terminal Block | Valve2- Analog Command (0 to 10V) |
| 18-Terminal Block | Valve2- Feedback |
| 19-Terminal Block | Valve3- 24VDC + |
| 20-Terminal Block | Valve3- 24VDC – (GND) |
| 21-Terminal Block | Valve3- Analog Command (0 to 10V) |
| 22-Terminal Block | Valve3- Feedback |
| 23-Terminal Block | Valve4- Open 24VDC + |
| 24-Terminal Block | Valve4- Close 24VDC + |
| 25-Terminal Block | Valve4- 24VDC – (GND) |
| 26-Terminal Block | Water Flow1- 24VDC + |
| 27-Terminal Block | Water Flow1- 24VDC – (GND) |
| 28-Terminal Block | Water Flow1- Signal |
| 29-Terminal Block | Water Flow2- 24VDC + |
| 30-Terminal Block | Water Flow2- 24VDC – (GND) |
| 31-Terminal Block | Water Flow2- Signal |
| 32-Terminal Block | Water Flow3- 24VDC + |
| 33-Terminal Block | Water Flow3- 24VDC – (GND) |
| 34-Terminal Block | Water Flow3- Signal |
| 35-Terminal Block | Level sensor 1- 24VDC + |
| 36-Terminal Block | Level sensor 1-Status |
| 37-Terminal Block | Level sensor 2- 24VDC + |
| 38-Terminal Block | Level sensor 2- Status |
| 39-Terminal Block | RS485 Serial D+ |
| 40-Terminal Block | RS485 Serial D- |
| 41-Terminal Block | RS485 Serial GND |

# Operating the Plant

## Column



→ flowchart of Column

→ Download the App

## Operating steps

1. In the mixture put 338 Kg of Ashes with 1690 L 0f acid of 15.8 mol/l of concentration
2. Turn on the motor (M1)
3. Open the Valve 2 and ON the pump (P2) to reach the column to the level (a) of ash mixed with nitric acid
4. When thelevel of liquid in the column reaches the top left nozzle (a), Turn Off the Pump (P2) and Close the Valve 2.
5. Turn on the motor (M2)
6. Open the Valve 1 and Turn on the pump (P1) to put the solvent (LIX : LIX® 984N )
7. When the level of liquid reahes the top lef nozzle (b), Turn Off the Pump and Close the Valve 1.
8. Wait Time ... min.

Allow the interface to form between the top mesh (a) and the top left nozzle (b). The interface appears as an immiscible layer between acid and extractant with droplets

1. Turn On the Pump (P1) and Open the valves (V1) and (V4) to set the extractant (Solvent) flow rate (equal between the inputs and the output).
2. Turn On the Pump (P2) and Open the valves (V2) and (V3) to set the aqueous phase flow rate (equal between the inputs and the output).