

Table 1: Oil properties at 25 °C

| Properties | Rhodorsil oil 47v5 | Rhodorsil oil 47v50 | Rhodorsil oil 47v100 |
|-------------------|-------------------------|-------------------------|-------------------------|
| Dynamic viscosity | 5 mPa.s | 50 mPa.s | 100 mPa.s |
| Density | 910 kg m ⁻³ | 959 kg m ⁻³ | 965 kg m ⁻³ |
| Surface tension | 19.7 mN m ⁻¹ | 20.7 mN m ⁻¹ | 20.9 mN m ⁻¹ |

Table 2: Composition of the aqueous solution

| Components | Concentrations |
|---|-----------------------|
| NH ₄ Cl | 5.5 g L ⁻¹ |
| KH ₂ PO ₄ | 3.4 g L ⁻¹ |
| Na ₂ HPO ₄ , H ₂ O | 3.8 g L ⁻¹ |
| Nutritive solution | 50 mL L ⁻¹ |

Table 3: Composition of the nutritive solution (adapted from [37])

| Components | Concentrations |
|---|--------------------------|
| MgSO ₄ , 7H ₂ O | 0.25 g L ⁻¹ |
| CaCl ₂ , 2H ₂ O | 0.065 g L ⁻¹ |
| ZnSO ₄ , 7H ₂ O | 0.02 g L ⁻¹ |
| CuSO ₄ , 5H ₂ O | 0.005 g L ⁻¹ |
| (NH ₄) ₆ Mo ₇ O ₂₄ , 6H ₂ O | 0.0035 g L ⁻¹ |
| (NH ₄) ₂ Fe(SO ₄) ₂ , 6H ₂ O | 0.14 g L ⁻¹ |

Table 4: scale evaluation of the separation of the oil and liquid phase

| Parameters of the efficiency separation | Weight assigned to each parameter |
|---|-----------------------------------|
| Quantity of drops of oil | 3 |
| Drop size | 5 |
| Dispersion of the drop size | 5 |
| Oil clearness | 7 |
| Aqueous phase clearness | 1 |
| Presence of activated sludge at the interface | 3 |
| Thickness of the interface | 1 |

Table 5: Centrifugal acceleration rate versus the agitation rate (Rhodorsil oil 47v5).

| Agitation speed (rpm) | Value of centrifugal acceleration for an efficient separation |
|-----------------------|---|
| 200 | 648 - 1000 g |
| 300 | 1460 - 2600 g |
| 550 | 6800 - 7900 g |

Table 6: Centrifugal acceleration needed versus oil viscosity

| Oil viscosity (mPa s) | Value of centrifuge acceleration after which the phases are separated |
|-----------------------|---|
| 5 | 1460 - 2600 g |
| 50 | 7950 - 13130 g |
| 100 | 7950 - 13130 g |

Table 7: Dimension of the hydrocyclone used for the model

| D_c | D_n/D_c | L_3/D_c | α | β | D_s | Emulsion flow rate |
|-------|-----------|-----------|----------|---------|-------|----------------------|
| 60 mm | 0.5 | 21 | 10 | 0.67 | 16 mm | 60 L h ⁻¹ |