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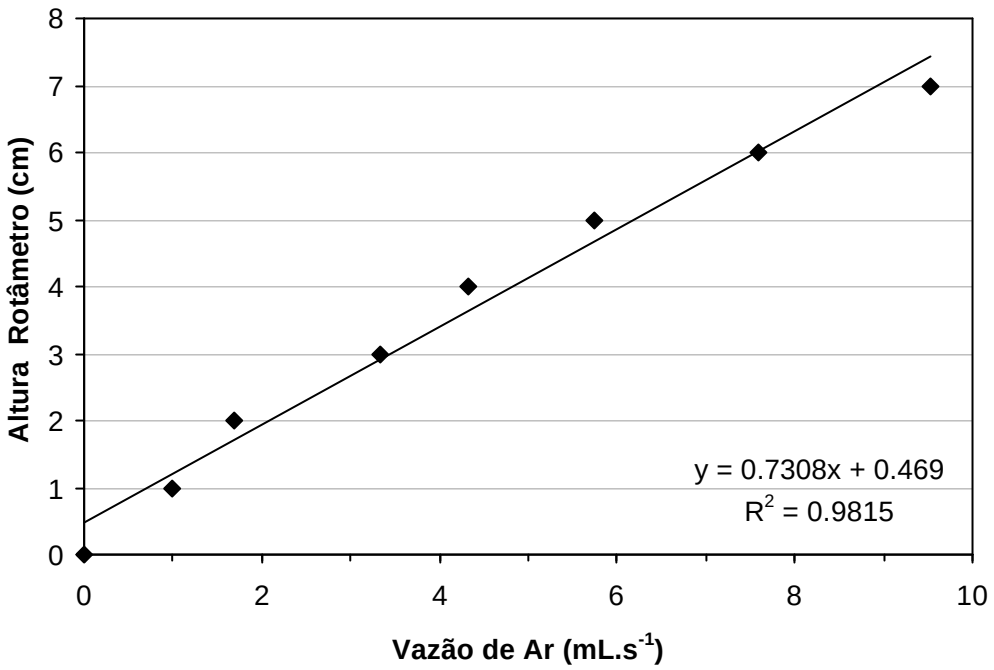
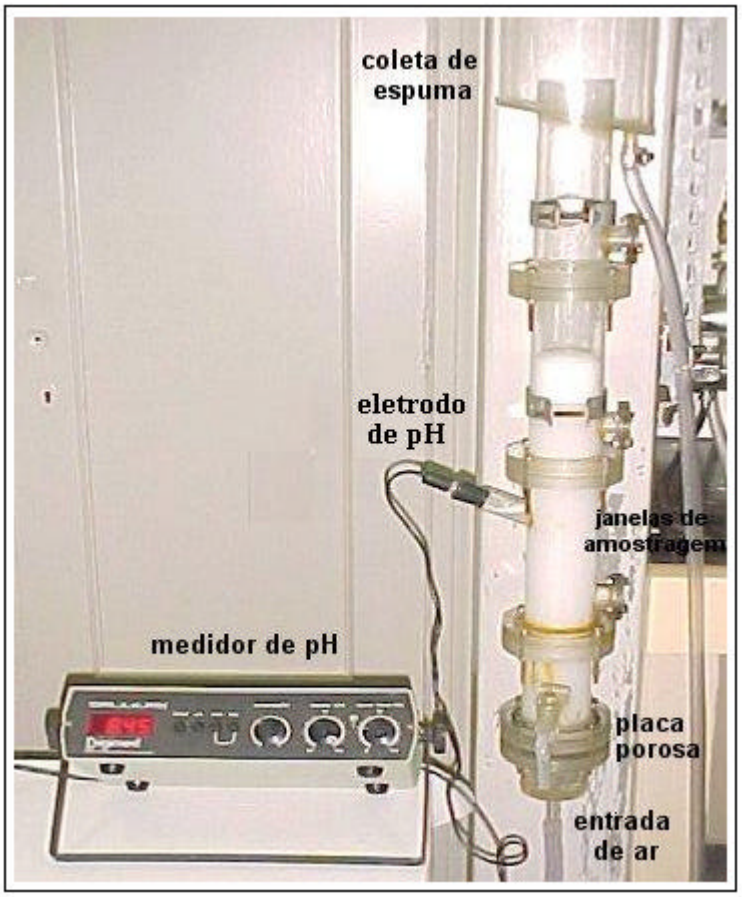
# 10
# ANEXOS

## 10.1.
## Aparelho Zeta Master- Malvern Instruments, equipado com um microprocessador empregado para a Medição do Potencial Zeta

## 10.2.
## Curva de Calibração do Rotâmetro



## 10.3.
## Linha de Montagem da Coluna de Flotação



## 10.4.
## Relação entre a remoção de cromo (III) e a concentração de coletor

| Tempo (min) | 0,5x10$^{-4}$M | 1x10$^{-4}$M | 1,5x10$^{-4}$M |
|---|---|---|---|
| 0 | 0.00 | 0.00 | 0.00 |
| 5 | 62.36 | 85.87 | 40.01 |
| 10 | 85.92 | 91.56 | 79.97 |
| 15 | 92.23 | 92.51 | 91.45 |
| 20 | 94.32 | 92.89 | 94.47 |
| 30 | 95.62 | 93.75 | 95.75 |
| 50 | 95.57 | 96.20 | 96.07 |

## 10.5.
## Relação entre a remoção de cromo (III) e a vazão de ar

| Tempo (min) | 1,41 mL.s$^{-1}$ | 2,10 mL.s$^{-1}$ | 3,46 mL.s$^{-1}$ |
|---|---|---|---|
| 0 | 0.00 | 0.00 | 0.00 |
| 5 | 86.73 | 85.87 | 83.03 |
| 10 | 91.50 | 91.56 | 92.11 |
| 15 | 92.01 | 92.51 | 94.22 |
| 20 | 93.11 | 92.89 | 94.97 |
| 30 | 93.11 | 93.75 | 95.62 |
| 50 | 94.22 | 96.20 | 95.35 |

## 10.6.
## Relação entre a remoção de cromo (III) e a concentração de espumante

| Tempo (min) | Sem | 0.10% | 0.20% | 0.50% |
|---|---|---|---|---|
| 0 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 35.09 | 85.87 | 76.78 | 54.30 |
| 10 | 62.63 | 91.56 | 79.56 | 66.63 |
| 15 | 75.19 | 92.51 | 83.62 | 82.20 |
| 20 | 77.58 | 92.89 | 86.24 | 87.00 |
| 30 | 79.21 | 93.75 | 88.14 | 79.85 |
| 50 | 81.21 | 96.20 | 86.39 | 93.86 |

## 10.7.
## Variação do Potencial zeta do hidróxido de cromo em função do pH na presença de KCl

| pH | Potencial Zeta (mV) | | |
|---|---|---|---|
| | kCl $10^{-2}$M | kCl $10^{-3}$M | kCl $10^{-4}$M |
| 6.4 | 25.1 | | |
| 7.13 | 27.4 | | |
| 8.11 | 18.9 | | |
| 8.22 | 14.6 | | |
| 8.8 | -10.3 | | |
| 9.02 | -15.6 | | |
| 10.02 | -33.6 | | |
| 11.02 | -33.1 | | |
| 6.01 | | 30.2 | |
| 7.02 | | 24.2 | |
| 8.12 | | 19.3 | |
| 8.74 | | -13.5 | |
| 9.05 | | -25.9 | |
| 10.02 | | -33.7 | |
| 11.02 | | -35.7 | |
| 6.39 | | | 30.3 |
| 7 | | | 27.3 |
| 8.25 | | | 14.5 |
| 8.94 | | | -19.6 |
| 10.05 | | | -34.2 |
| 11.04 | | | -37.1 |

## 10.8.
## Efeito da adição de coletor (DSS) no potencial zeta do hidróxido de cromo

| pH | Potencial Zeta (mV) | | | |
|---|---|---|---|---|
| | Sem DSS | $10^{-5}$ M DSS | $10^{-4}$ M DSS | $10^{-3}$ M DSS |
| 6 | 42.8 | | | |
| 7 | 33.3 | | | |
| 8 | 14.9 | | | |
| 9 | -29 | | | |
| 10 | -39.1 | | | |
| 11 | -40 | | | |
| 6 | | 22.2 | | |
| 7 | | 0.5 | | |
| 8 | | -13 | | |
| 9 | | -32.6 | | |
| 10 | | -40.9 | | |
| 11 | | -43.8 | | |
| 6 | | | 2.8 | |
| 7 | | | -2.95 | |
| 8 | | | -14.3 | |
| 9 | | | -31.7 | |
| 10 | | | -41.3 | |
| 11 | | | -41.4 | |
| 6 | | | | -3 |
| 7 | | | | -3.2 |
| 8 | | | | -15 |
| 9 | | | | -26.9 |
| 10 | | | | -35.9 |
| 11 | | | | -38.1 |

## 10.9.
## Efeito da adição de íons cromo (III) no potencial zeta do $Cr(OH)_3$

| pH | Potencial Zeta (mV) | | | |
|---|---|---|---|---|
| | Sem $Cr^{3+}$ | $10^{-5}$M $Cr^{3+}$ | $10^{-4}$M $Cr^{3+}$ | $10^{-3}$M $Cr^{3+}$ |
| 6 | 42.8 | | | |
| 7 | 33.3 | | | |
| 8 | 14.9 | | | |
| 9 | -29 | | | |
| 10 | -39.1 | | | |
| 11 | -40 | | | |
| 6 | | 17.4 | | |
| 7 | | 8 | | |
| 8 | | -2 | | |
| 9 | | -31 | | |
| 10 | | -38.3 | | |
| 11 | | -39.5 | | |
| 6 | | | 26.7 | |
| 7 | | | 18.7 | |
| 8 | | | 15.9 | |
| 9 | | | -23.9 | |
| 10 | | | -38.1 | |
| 11 | | | -39.7 | |
| 6 | | | | 31.2 |
| 7 | | | | 29.3 |
| 8 | | | | 23.8 |
| 9 | | | | 1.6 |
| 10 | | | | -27.3 |
| 11 | | | | -37.7 |