Electrooxidation using Nb/BDD as post-treatment of a reverse osmosis concentrate in a petrochemical industry

Salatiel Wohlmuth da Silva¹,²*, Carla Denize Venzke², Júlia Bitencourt Welter², Daniela Eduarda Schneider², Jane Zoppas Ferreira², Marco Antônio Siqueira Rodrigues³, Andréa Moura Bernardes²

1 Universidade Federal do Rio Grande do Sul (UFRGS) – Instituto de Pesquisas Hidráulicas (IPH). Av. Bento Gonçalves, 9500, Porto Alegre/RS, Brasil; salatiel.silva@ufrgs.br

2 Universidade Federal do Rio Grande do Sul (UFRGS) - Programa de Pós-Graduação em Engenharia de Minas, Metalúrgica e de Materiais (PPGEM). Av. Bento Gonçalves, 9500, Porto Alegre/RS, Brasil; carladenize@gmail.com; juliabwelter@gmail.com; danielaeduardaschneider@hotmail.com; jane.zoppas@ufrgs.br; amb@ufrgs.br

2 Universidade Feevale, Campus II ERS-239, 2755, Novo Hamburgo, RS, Brasil.; marcor@feevale.br

* Correspondence: salatiel.silva@ufrgs.br; Phone number: +55 51 3308 9430; Av. Bento Gonçalves, 9500 - Setor IV - Prédio 43426 - Sala 103, Porto Alegre, Rio Grande do Sul, Brasil
Table S1. Applied current density of 5 mA·cm$^{-2}$ and the achieved cell potential with time.

| Time (h) | Cell potential (V) |
|----------|---------------------|
| 0        | 12.3                |
| 1        | 12.4                |
| 2        | 12.3                |
| 3        | 12.3                |
| 4        | 12.3                |
| 5        | 12.3                |

Table S2. Applied current density of 10 mA·cm$^{-2}$ and the achieved cell potential with time.

| Time (h) | Cell potential (V) |
|----------|---------------------|
| 0        | 22.8                |
| 1        | 22.5                |
| 2        | 22.5                |
| 3        | 22.8                |
| 4        | 22.4                |
| 5        | 22.1                |

Table S3. Applied current density of 20 mA·cm$^{-2}$ and the achieved cell potential with time.

| Time (h) | Cell potential (V) |
|----------|---------------------|
| 0        | 38.5                |
| 1        | 38.7                |
| 2        | 38.5                |
| 3        | 38.5                |
| 4        | 38.5                |
| 5        | 38.5                |
**Figure S1.** Influence of applied current densities on the (a) TOC removal and (b) COD reduction.
Figure S2. Chromatograms for (a) Reverse Osmosis Concentrate (ROC) before the application of EOP and after the EOP applying (b) 5 mA·cm$^{-2}$, (c) 20 mA·cm$^{-2}$ and (d) 30 mA·cm$^{-2}$.
Figure S3. Influence of applied current densities on the pH.