Journal Pre-proofs

Electrocatalytic Generation of Homogeneous and Heterogeneous Hydroxyl Radicals for Cold Mineralization of Anti-cancer Drug Imatinib

Weilu Yang, Nihal Oturan, Stephane Raffy, Minghua Zhou, Mehmet A. Oturan

PII: S1385-8947(19)32567-7
DOI: https://doi.org/10.1016/j.cej.2019.123155
Reference: CEJ 123155

To appear in: *Chemical Engineering Journal*

Received Date: 2 August 2019
Revised Date: 2 October 2019
Accepted Date: 12 October 2019

Please cite this article as: W. Yang, N. Oturan, S. Raffy, M. Zhou, M.A. Oturan, Electrocatalytic Generation of Homogeneous and Heterogeneous Hydroxyl Radicals for Cold Mineralization of Anti-cancer Drug Imatinib, *Chemical Engineering Journal* (2019), doi: https://doi.org/10.1016/j.cej.2019.123155

Electrocatalytic Generation of Homogeneous and Heterogeneous Hydroxyl Radicals for Cold Mineralization of Anti-cancer Drug Imatinib

Weilu Yang[a,b,c,d], Nihal Oturan[d], Stephane Raffy[e], Minghua Zhou[a,b,c,*], Mehmet A. Oturan[d,*]

[a] *Key Laboratory of Pollution Process and Environmental Criteria, Ministry of Education, College of Environmental Science and Engineering, Nankai University, Tianjin 300350, China.*

[b] *Tianjin Key Laboratory of Environmental Technology for Complex Trans-Media Pollution, Nankai University, Tianjin 300350, China*

[c] *Tianjin Advanced Water Treatment Technology International Joint Research Center, College of Environmental Science and Engineering, Nankai University, Tianjin 300350, China*

[d] *Université Paris-Est, Laboratoire Géomatériaux et Environnement, EA 4508, UPEM, 5 Bd Descartes, 77454 Marne-la-Vallée, Cedex 2, France.*

[e] *Saint-Gobain Research Provence, 550 avenue Alphonse Jauffret, 84300 Cavaillon, France*

*: Corresponding author's Email

zhoumh@nankai.edu.cn (Minghua Zhou)

Mehmet.oturan@univ-paris-est.fr (Mehmet A. Oturan)

Abstract

The effective removal of anti-cancer drug imatinib (IMA) from water was explored by electrochemical advanced oxidation processes electro-Fenton (EF) and anodic oxidation (AO-H_2O_2) using different kinds of anode material: Pt, DSA (Ti/RuO_2-IrO_2), BDD and sub-stoichiometric titanium oxide (Ti_4O_7) and carbon felt cathode. IMA was then destroyed by hydroxyl radicals (•OH) generated in the system. A series of comparison experiments including oxidative degradation kinetics of IMA, total organic carbon (TOC) removal and mineralization efficiency were conducted at ambient temperature. In both cases, DSA and Pt anodes were less effective for the anodic oxidation and