



## PhD Candidate Profile

### Name:

Alexandre Della-Flora

### Research Group (if relevant):

Grupo de pesquisa em metodologias analíticas e processos avançados-GMAPS

### Research Centre (if relevant):

N/A



### Department/School(s) (if relevant):

Instituto de Química - Dep. de Química Inorgânica

### College:

Universidade Federal do Rio Grande do Sul

### Supervisor(s):

Dr. Carla Sirtori

### Funding body:

Coordenação de Aperfeiçoamento de Pessoal de Nível Superior

### Area (field) of study:

Removal of emerging contaminants in water by advanced oxidation processes

### Thesis Title:

EVALUATION OF SOLAR PHOTOCATALYTIC AND COUPLING WITH ADSORPTION PROCESSES FOR PHARMACEUTICALS MITIGATION IN HOSPITAL WASTEWATER

### Abstract:

The presence of emerging contaminants in the environment has been increasing in recent years due to the wide use of drugs, pesticides, personal hygiene products, among others. In this sense, special attention has been given to pharmaceuticals, since such compounds, when present in different environmental compartments, can cause various adverse effects and even generate or increase bacterial resistance in aquatic organisms and humans. In addition, effluent treatment plants generally employ biological treatments. Such systems were not designed for pharmaceutical treatment. This is because these contaminants are not biodegradable and in many cases may be toxic or inhibit the pool of microorganisms that constitute the different biological processes conventionally employed. Thus, there is a need for further studies to evaluate the use of different treatments for the degradation and removal



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of these contaminants. Among the most promising treatments for the treatment of effluents and complex wastewater are the Advanced Oxidation Processes (AOPs), especially the Fenton and photo-Fenton process at neutral pH. In turn, the adsorption processes, especially the treatments that employ activated carbon produced through biomass presents itself as an alternative for the removal of different contaminants. In this context, the objective of this thesis is to evaluate the use of Fenton / photo-Fenton processes combined with the adsorption process for degradation and removal of drugs present in simulated effluent and wastewater from a hospital center.

### Collaborations:

Dr. Éder Claudio Lima - Laboratório de Tecnologia Ambiental e Analítica (LATAMA)-UFRGS

### Publications:

- Della-Flora, A., Wielens Becker, R., Frederigi Benassi, S., Theodoro Toci, A., Cordeiro, G.A., Ibáñez, M., Portolés, T., Hernández, F., Boroski, M., Sirtori, C., 2019. Comprehensive investigation of pesticides in Brazilian surface water by high resolution mass spectrometry screening and gas chromatography–mass spectrometry quantitative analysis. *Sci. Total Environ.* 669, 248–257. <https://doi.org/10.1016/j.scitotenv.2019.02.354>
- Della-Flora, A., Becker, R.W., Ferrão, M.F., Toci, A.T., Cordeiro, G.A., Boroski, M., Sirtori, C., 2018. Fast, cheap and easy routine quantification method for atrazine and its transformation products in water matrixes using a DLLME-GC/MS method. *Anal. Methods* 10, 5447–5452. <https://doi.org/10.1039/C8AY02227E>

### Presentations:

XIV LASEAC. Solar photo-Fenton degradation of Flutamide from water: Elucidation of transformation products by LC-QTOFMS. (Conference)

7<sup>o</sup> BRMASS. DEVELOPMENT OF A ROUTINE QUANTIFICATION METHOD FOR ATRAZINE AND THEIR TRANSFORMATION PRODUCTS USING DISPERSIVE LIQUID–LIQUID MICROEXTRACTION COUPLED WITH GC–MS (Conference)

ISEAC-40. INVESTIGATION OF PESTICIDES IN SURFACE WATER FROM BRAZIL BY COMBINED USE OF UHPLC-QTOF MS SCREENING AND DLLME/GC-MS QUANTITATIVE ANALYSIS. (Conference)

VIII ENQAMB. DESENVOLVIMENTO DE METODOLOGIA PARA ANÁLISE DE ATRAZINA E SEUS PRODUTOS DE DEGRADAÇÃO (DIA E DEA) EMPREGANDO MICROEXTRAÇÃO LÍQUIDO-LÍQUIDO DISPERSIVA E GC-MS. (Conference)