

# FOTOCATGRAF

## **An Advanced Technology for a Safe and Sustainable Water Supply**

FOTOCATGRAF – Graphene-based semiconductor photocatalysis for a safe and sustainable water supply: an advanced technology for emerging pollutants removal - UTAP-ICDT/CTM-NAN/0025/2014



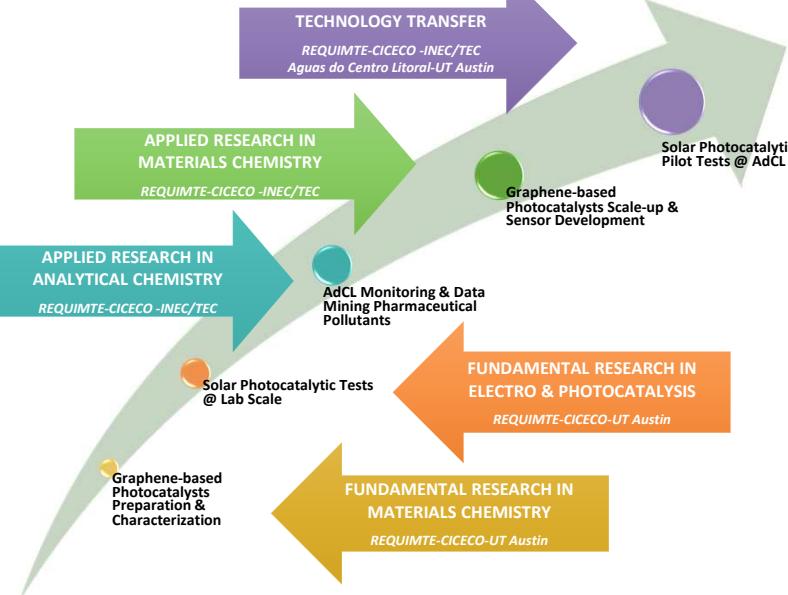
**Design and produce a new generation of high-performance graphene-based multicomponent solar photocatalysts for the removal of emerging pollutants – pharmaceuticals – from the wastewater treatment stations of Portugal centre region, monitored by Águas d CentroLitoral- Portugal - AdP - Águas de Portugal.**

TEAM

Consortium Portugal & UT Austin

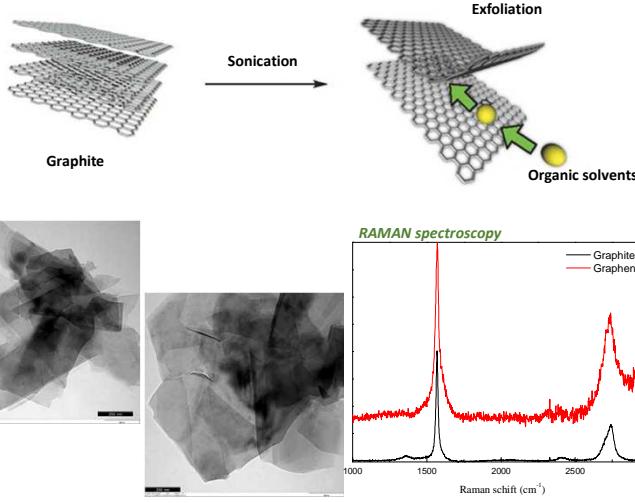
- | Consortium Portugal & UT Austin   |   |
|---|---|
| <ul style="list-style-type: none"> <li><b>Cristina Freire (PI)</b></li> <li>Clara Pereira</li> <li>Diana Fernandes</li> <li>Iwona K. Biernacka</li> <li>Mariana Araújo</li> <li>Mariana Rocha</li> <li>Ricardo Carvalho</li> <li>Cristina Matos</li> <li>Maria Correia</li> <li>Sanda Figueiredo</li> </ul> | <b>REQUIMTE</b><br>Univ. Porto  |
| <b>CICECO/UA</b> <ul style="list-style-type: none"> <li>Tito Trindade</li> <li>Helena Nogueira</li> <li>Ana Estrada</li> <li>Joana Lopes</li> </ul>   | <ul style="list-style-type: none"> <li>Materials Chemistry &amp; Graphene, Metal oxides, Catalysis</li> <li>Analytical Chemistry &amp; Advanced Wastewater Treatment Technologies</li> </ul>  |
| <b>INESC/TEC-UP</b> <ul style="list-style-type: none"> <li>Luis Lopes</li> <li>Luis Torgo</li> <li>Gil Ferro</li> </ul>   | <b>CICECO</b><br>Univ. Aveiro   |
| <b>AdCL</b> <ul style="list-style-type: none"> <li>Sandra Jorge</li> <li>Gabriel Silva</li> </ul>   | <ul style="list-style-type: none"> <li>Materials Chemistry &amp; Graphene,</li> <li>Metal sulphides &amp; Polyoxometalates, Catalysis</li> </ul>  |
| <b>UT Austin</b>  | <b>INESC/TEC</b><br>Univ. Porto   |
| <b>Águas do Centro Litoral</b>  | <ul style="list-style-type: none"> <li>Wireless Sensor Networks</li> <li>Data Mining</li> </ul>   |
|   | <ul style="list-style-type: none"> <li>Construction, operation &amp; management of Lis Multimunicipal Sanitation system restoring, valorizing and protecting water resources</li> <li>End-user of the new wastewater treatment plant</li> </ul> |

## WORK PACKAGES & CONSORTIUM

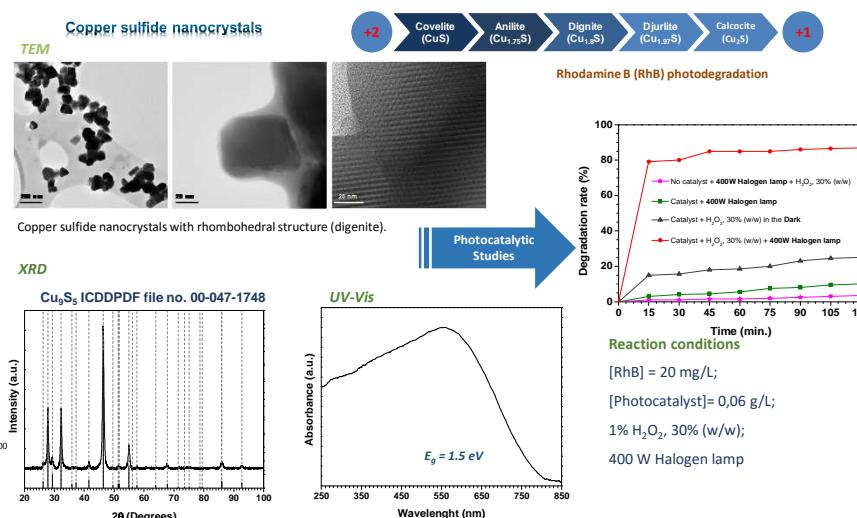


## OUTCOMES

## Graphene production

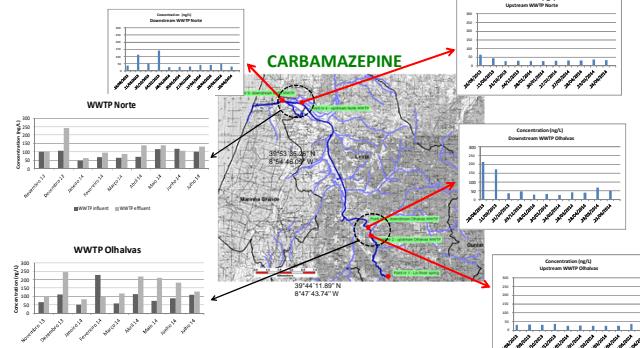


## Synthesis of Copper Sulfide Semiconductor Nanoparticles



## **Impact of urban wastewaters to the load of pharmaceuticals into surface waters**

- Analytical tools to detect and quantify PPs in wastewaters to obtain environmental data on pharmaceuticals occurrence in AdCL WWTP.
  - Data mining algorithms to detect patterns in the use of pharmaceuticals over periods of time in AdCL.
  - Photocatalysts scale-up production for those with best catalytic performances.



Development of wireless electrochemical sensor prototype

- Prototype for analog/digital sensor that performs cyclic voltammetry measurements.
  - Undergoing final phases of programming and testing.
  - The sensor can then be programmed to be part of a wireless network automatically programmed to perform such measurements and to periodically send them to a server for storage and/or processing.

