

## PhD Candidate Profile

**Name:**

A. Michelle Navarrete-Magaña

**Research Group (if relevant):**

ECOCATALISIS

**Research Centre (if relevant):**

N/A

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

Department of Chemistry

**College:**

Autonomous Metropolitan University

**Supervisor(s):**

Dr. Ricardo Gómez Romero

**Funding body:**

N/A

**Area (field) of study:**

Oxidation of arsenic in aqueous solution by advanced oxidation processes

**Thesis Title:**

Synthesis, characterization and study of the photocatalytic properties of  $\text{TiO}_2$  modified with  $\text{WO}_3$  in the treatment of arsenic (III) in aqueous solution by oxidation process.

**Abstract:**

Arsenic (As) is a natural element widely distributed in the Earth's crust and has gained remarkable attention due to its toxic properties and for being responsible for a disease known as endemic regional chronic hydroarsenicism (HACRE), which in man culminates in lesions and skin cancer. The predominant species in natural waters exists mostly as arsenite ( $\text{As(III)}$ ) and arsenate ( $\text{As(V)}$ ). Elimination of  $\text{As(V)}$  can be efficiently removed by common water treatment methods, such as coagulation with ferric chloride, alum, with the use of anionic exchange resins or activated alumina. However, the removal of  $\text{As(III)}$  by such processes can be quite variable and is often substantially less efficient, due  $\text{As(III)}$  it's less stable, more mobile and toxic.

Heterogeneous photocatalysis with  $\text{TiO}_2$  is one of the most studied advanced oxidation processes for removal of contaminants in water, due to its applicability and for being an environmentally way to achieve the oxidation of  $\text{As(III)}$  into  $\text{As(V)}$ .

Base on the above, we have decided to carry out photocatalytic oxidation experiments of  $\text{As(III)}$  in aqueous solution in order to elucidate the interaction of arsenite and



## PhD Candidate Profile

arsenate onto TiO<sub>2</sub>-based nanomaterials as a function of initial pH, dosage of catalyst and the photocatalytic activity under UV irradiation.

### Collaborations:

N/A

### Publications:

M. Navarrete, S. Cipagauta-Díaz, R. Gómez. Ga<sub>2</sub>O<sub>3</sub>/TiO<sub>2</sub> semiconductors free of noble metals for the photocatalytic hydrogen production in a water/methanol mixture. Journal of Chemical Technology and Biotechnology 2019; 94: 3457-3465.

### Presentations:

VII International Congress and XVI Mexican Congress of Catalysis. Villahermosa, Tabasco, 10-15 November 2019.

XXVIII International Materials Research Congress. Cancun, Mexico 18-23 August 2019.

5th International Congress on Water, Waste and Energy Management (WWEM-19). Paris, France 22 -July 24, 2019.

XXVII International Materials Research Congress. Cancun, Mexico, 19-24 August 2018.