

# Recyclable Cyclodextrin Nanosponges for the Removal of Emerging Contaminants

**Vito Rizzi<sup>1\*</sup>, Jennifer Gubitosa<sup>1</sup>, Angela Agostiano<sup>1,2</sup>, Francesco Trotta<sup>3</sup>, Paola Fini<sup>2</sup>, Pinalysa Cosma<sup>1,2</sup>**

<sup>1</sup>Dipartimento di Chimica, Università degli Studi “Aldo Moro”

Via Orabona, 4- 70126, Bari, Italy

[vito.rizzi@uniba.it](mailto:vito.rizzi@uniba.it); [jennifer.gubitosa@uniba.it](mailto:jennifer.gubitosa@uniba.it);

<sup>2</sup>Consiglio Nazionale delle Ricerche CNR-IPCF UOS

Via Orabona, 4- 70126 Bari, Italy

[p.fini@ba.ipcf.cnr.it](mailto:p.fini@ba.ipcf.cnr.it); [angela.agostiano@uniba.it](mailto:angela.agostiano@uniba.it); [pinalysa.cosma@uniba.it](mailto:pinalysa.cosma@uniba.it)

<sup>3</sup>Dipartimento di Chimica, Università degli Studi di Torino

Via Pietro Giuria 7, 10125, Torino, Italy

[francesco.trotta@unito.it](mailto:francesco.trotta@unito.it)

## Extended Abstract

In the last years, the interest regarding the detection and the removal of pharmaceuticals, personal care products etc., called “Emerging Contaminants” (ECs), from aquatic environment is increased, stressing the emergency related to their removal from water. [1] So, platforms for their removal by applying new efficient, sustainable, and low-cost wastewater treatment technologies, should be developed. Among various approaches, the adsorption could be considered suitable to remove ECs, avoiding the release of other pollutants usually arisen from chemical treatments. More specifically, a patented adsorbent material, developed at University of Turin (Italy), based on cyclodextrin polymers was selected during this work. [2] It consists of positively charged cross-linked mixture of cyclodextrins. As first step, the chemical and physical characterization of the adsorbent was performed by adopting several complementary techniques. To detail the adsorption process towards different ECs, the effect of several experimental parameters such as the pH and temperature values, ionic strength, amount of adsorbent and pollutant were investigated. [2] Notably, among pollutants, the attention was focused on Ciprofloxacin removal. Interestingly, great adsorption capacities values were obtained. The kinetics, isotherms models of adsorption and the thermodynamic parameters ( $\Delta G^\circ$ ,  $\Delta H^\circ$  and  $\Delta S^\circ$ ) were also evaluated. [2] Finally, with the aim to re-use both the adsorbent and the pollutant for several cycles of adsorption/desorption, a low-cost and cleaner approach was developed obtaining very interesting results. [2]

## References

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