

Accepted Manuscript

The combined toxicity of UV/chlorinated products from binary ibuprofen (IBP) and tyrosine (Tyr) on *Escherichia coli*: Emphasis on their occurrence and underlying mechanism

Han Chen, Tao Lin, Wei Chen



PII: S0045-6535(18)31292-X

DOI: [10.1016/j.chemosphere.2018.07.034](https://doi.org/10.1016/j.chemosphere.2018.07.034)

Reference: CHEM 21749

To appear in: *ECSN*

Received Date: 19 April 2018

Revised Date: 6 July 2018

Accepted Date: 8 July 2018

Please cite this article as: Chen, H., Lin, T., Chen, W., The combined toxicity of UV/chlorinated products from binary ibuprofen (IBP) and tyrosine (Tyr) on *Escherichia coli*: Emphasis on their occurrence and underlying mechanism, *Chemosphere* (2018), doi: 10.1016/j.chemosphere.2018.07.034.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 **The combined toxicity of UV/chlorinated products from binary ibuprofen (IBP) and tyrosine**
2 **(Tyr) on *Escherichia Coli*: emphasis on their occurrence and underlying mechanism**

3 Han Chen^{a, b}, Tao Lin^{a, b, *}, Wei Chen^{a, b}

4 ^a Ministry of Education Key Laboratory of Integrated Regulation and Resource Development on Shallow Lakes,
5 Hohai University, Nanjing 210098, PR China

6 ^b College of Environment, Hohai University, Nanjing 210098, PR China

7 (* Corresponding author: Email:hit_lintao@163.com; Fax: +86 02583787134; Tel: +86 13951690290)

8 **Abstract:** In this study, the combined toxicity of UV/chlorinated products on *Escherichia Coli* (*E.*
9 *coli*) was investigated when ibuprofen (IBP) and tyrosine (Tyr) were used as two precursors. The
10 median-effect equation and combined index (CI)-isobologram equation were used to evaluate the
11 combined toxicity of UV/chlorinated products. Results revealed that the UV/chlorinated products
12 originated from binary Tyr and IBP showed a synergism in toxicity on *Escherichia Coli* at low
13 concentration level while it turned into a clear antagonism effect above a f_a value of 0.2 in the
14 toxicity trial. The combined toxic effects on *E. coli* were determined by both the potential toxicity
15 mode of specific disinfection byproducts (DBPs) and the complicated interaction caused by Tyr
16 and IBP. The addition of IBP decreased the yield of N-DBPs generated from Tyr, which dominated
17 the effect of combined toxicity. Even though the antagonism predominated in toxicity effect on *E.*
18 *coli*, the synergistic toxicity at low dose levels should be getting attention, which was more close
19 to the natural concentration of N-DBPs in waters.

20
21 **Keywords:** UV/chlorine; *Escherichia Coli*; combined toxicity; disinfection byproducts

22

Download English Version:

<https://daneshyari.com/en/article/8850452>

Download Persian Version:

<https://daneshyari.com/article/8850452>

[Daneshyari.com](https://daneshyari.com)