



GEMaC

Groupe d'Étude
de la Matière Condensée

ENHANCED PHOTOCATALYTIC ACTIVITY OF ZNO NANOSTRUCTURES FOR WATER AND PURIFICATION: FROM MICROFLUIDICS TO 5TH GENERATION ROAD

par Mme Yamin Leprince , de l'Université Paris-Est Marne-la-Vallée

Jeudi 31 janvier 2019

à 14h

Salle F4109 du Gemac

45 avenue des Etats-Unis

78035 Versailles cedex

/**/<!-- /* Font Definitions */@font-face {font-family:Arial; panose-1:2 11 6 4 2 2 2 2 4;
mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-

signature:-536859905 -1073711037 9 0 511 0;}}@font-face {font-family:"Cambria Math"; panose-1:2 4 5 3 5 4 6 3 2 4; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1107305727 0 0 415 0;}}@font-face {font-family:Calibri; panose-1:2 15 5 2 2 2 4 3 2 4; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-520092929 1073786111 9 0 415 0;}} /* Style Definitions */p.MsoNormal, li.MsoNormal, div.MsoNormal {mso-style-unhide:no; mso-style-qformat:yes; mso-style-parent:""; margin-top:0cm; margin-right:0cm; margin-bottom:10.0pt; margin-left:0cm; line-height:115%; mso-pagination:none; font-size:11.0pt; font-family:Calibri; mso-ascii-font-family:Calibri; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:Calibri; mso-fareast-theme-font:minor-latin; mso-hansi-font-family:Calibri; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi; mso-ansi-language:EN-US; mso-fareast-language:EN-US;}.MsoChpDefault {mso-style-type:export-only; mso-default-props:yes; font-size:11.0pt; mso-ansi-font-size:11.0pt; mso-bidi-font-size:11.0pt; font-family:Calibri; mso-ascii-font-family:Calibri; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:Calibri; mso-fareast-theme-font:minor-latin; mso-hansi-font-family:Calibri; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi; mso-ansi-language:EN-US; mso-fareast-language:EN-US;}.MsoPapDefault {mso-style-type:export-only; margin-bottom:10.0pt; line-height:115%; mso-pagination:none;}@page WordSection1 {size:596.0pt 842.0pt; margin:49.0pt 51.0pt 0cm 51.0pt; mso-header-margin:37.45pt; mso-footer-margin:36.0pt; mso-paper-source:0;}div.WordSection1 {page:WordSection1;}@page WordSection2 {size:596.0pt 842.0pt; margin:49.0pt 51.0pt 14.0pt 52.0pt; mso-header-margin:37.45pt; mso-footer-margin:0cm; mso-paper-source:0;}div.WordSection2 {page:WordSection2;}-->/**/**/<!-- /* Font Definitions */@font-face {font-family:Arial; panose-1:2 11 6 4 2 2 2 2 2 4; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536859905 -1073711037 9 0 511 0;}@font-face {font-family:Times; panose-1:2 0 5 0 0 0 0 0 0 0; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:3 0 0 0 1 0;}@font-face {font-family:"ＭＳ 明朝"; mso-font-charset:78; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1791491579 18 0 131231 0;}@font-face {font-family:"Cambria Math"; panose-1:2 4 5 3 5 4 6 3 2 4; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1107305727 0 0 415 0;}@font-face {font-family:Cambria; panose-1:2 4 5 3 5 4 6 3 2 4; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1073743103 0 0 415 0;} /* Style Definitions */p.MsoNormal, li.MsoNormal, div.MsoNormal {mso-style-unhide:no; mso-style-qformat:yes; mso-style-parent:""; margin:0cm; margin-bottom:.0001pt; mso-pagination:widow-orphan; font-size:11.0pt; font-family:Cambria; mso-ascii-font-family:

Cambria; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:Cambria; mso-fareast-theme-font:minor-latin; mso-hansi-font-family:Cambria; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi; mso-fareast-language:EN-US;}.MsoChpDefault {mso-style-type:export-only; mso-default-props:yes; font-size:11.0pt; mso-ansi-font-size:11.0pt; mso-bidi-font-size:11.0pt; font-family:Cambria; mso-ascii-font-family:Cambria; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:"ＭＳ 明朝"; mso-fareast-theme-font:minor-fareast; mso-hansi-font-family:Cambria; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi; mso-ansi-language:EN-GB; mso-fareast-language:JA;}@page WordSection1 {size:612.0pt 792.0pt; margin:70.85pt 70.85pt 70.85pt 70.85pt; mso-header-margin:36.0pt; mso-footer-margin:36.0pt; mso-paper-source:0;}div.WordSection1 {page:WordSection1;}-->/**/**/ <!-- /* Font Definitions */@font-face {font-family:Arial; panose-1:2 11 6 4 2 2 2 2 4; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536859905 -1073711037 9 0 511 0;}@font-face {font-family:"ＭＳ 明朝"; mso-font-charset:78; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1791491579 18 0 131231 0;}@font-face {font-family:"ＭＳ 明朝"; mso-font-charset:78; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1791491579 18 0 131231 0;}@font-face {font-family:Cambria; panose-1:2 4 5 3 5 4 6 3 2 4; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1073743103 0 0 415 0;} /* Style Definitions */p.MsoNormal, li.MsoNormal, div.MsoNormal {mso-style-unhide:no; mso-style-qformat:yes; mso-style-parent:""; margin:0cm; margin-bottom:.0001pt; mso-pagination:widow-orphan; font-size:11.0pt; font-family:Cambria; mso-ascii-font-family:Cambria; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:Cambria; mso-fareast-theme-font:minor-latin; mso-hansi-font-family:Cambria; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi; mso-fareast-language:EN-US;}.MsoChpDefault {mso-style-type:export-only; mso-default-props:yes; font-size:11.0pt; mso-ansi-font-size:11.0pt; mso-bidi-font-size:11.0pt; font-family:Cambria; mso-ascii-font-family:Cambria; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:"ＭＳ 明朝"; mso-fareast-theme-font:minor-fareast; mso-hansi-font-family:Cambria; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi; mso-ansi-language:EN-GB; mso-fareast-language:JA;}@page WordSection1 {size:612.0pt 792.0pt; margin:70.85pt 70.85pt 70.85pt 70.85pt; mso-header-margin:36.0pt; mso-footer-margin:36.0pt; mso-paper-source:0;}div.WordSection1 {page:WordSection1;}-->/**/

The impact on environment and on human health of different pollutants, especially chemical pollutants, is becoming critical due to their drastic consequences on our main vital resources: water

and air. In recent years, extensive efforts of fundamental research and developing practical processes have been devoted to the polluted water & air treatment. The semiconductor-based photocatalytic process has shown a great potential as an environmental-friendly and sustainable treatment technology by using solar energy. Among the photocatalytic materials, nanostructured ZnO is a promising candidate for its high surface/volume ratio, its easy-controllable & low cost synthesis, and its chemical & thermal stability. The ability of ZnO based photocatalysis technology has been widely demonstrated to remove persistent organic compounds (such as dyes, antibiotics, & microorganisms) in water, and toxic gases (such as NO_x, COVs, ...) in air; and its photocatalytic efficiency can be enhanced by transition metal doping process. ZnO nanostructure is also a promising candidate in microfluidic application for their easy-controllable synthesis and integration in a microfluidic system. ZnO nanostructures can also be synthesized on civil engineering materials for self-cleaning road application to avoid the soil pollution.

Biography:

Yamin Leprince-Wang is Full Professor at the University of Paris-Est Marne-la-Vallée, France, where she is also Head of the Materials Science & Engineering Master's degree course. Her main research interest consists of synthesis and characterization of 1D & 2D oxide nanomaterials and their applications in energy and environment fields, such as nanogenerator of electricity, solar cells, chemical sensors, and water & air purification using photocatalysis process. She received B.S. degree from Zhejiang University in China (1985), M.S. and PhD degrees from University Paris VI in France in 1991 and 1995, respectively.