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## ABBREVIATIONS AND SYMBOLS

|   |  |
|---|--|
| °C  | Degree Celsius                                   |
| µg/l  | microgram per lite                               |
| µg/mL   | Microgram per millilitre                         |
| µmol  | Micromole  |
| Al-P  | Aluminum phosphate                               |
| <i>ars</i>                                      | arsenic-resistant gene                           |
| As  | Arsenic  |
| As(III)   | Arsenite   |
| As(V)   | Arsenate   |
| As <sup>+3</sup>                                | Arsenite   |
| As <sup>+5</sup>                                | Arsenate   |
| ASV   | Anodic stripping voltammetry                     |
| ATP   | Adenosine triphosphate                           |
| ATSDR   | Agency for Toxic Substances and Disease Registry |
| C   | Carbon   |
| Ca  | Calcium  |
| Ca <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub> | Calcium phosphate                                |
| CAO   | Chemoautotrophic Arsenite Oxidizer               |
| Ca-P  | Calcium phosphate                                |
| CCA   | chromated copper arsenate                        |
| Cd  | Cadmium  |
| CEC   | High cation exchange capacity                    |
| CFU   | Colony forming units                             |
| Cm  | Centimeter                                       |
| cm <sup>2</sup>                                 | centimetre squared                               |
| CO <sub>2</sub>                                 | Carbon dioxide                                   |
| CRD   | Completely Randomized Design                     |
| DMA   | dimethylarsinic acid                             |
| DMSO  | Dimethyl sulfoxide                               |

## ABBREVIATIONS AND SYMBOLS (CONTINUED)

|                  |   |
|------------------|---|
| DNA              | Deoxyribonucleic acids                                  |
| DW               | Dry weight  |
| e <sup>-</sup>   | Electron  |
| g                | Gram  |
| GC               | Gas chromatography                                      |
| H                | Hydrogen  |
| HAOs             | heterotrophic arsenite oxidizers                        |
| HG-AAS           | hydride generation-atomic absorption spectrometry       |
| HPLC             | High-pressure liquid chromatography                     |
| hr               | Hour  |
| IAA              | Indole acetic acid                                      |
| IARC             | The International Agency for Research on Cancer         |
| ICP-AES          | inductively coupled plasma atomic emission spectrometer |
| ICP-MS           | Inductively Coupled Plasma Mass Spectrometry            |
| K                | Potassium   |
| KCl              | Potassium chloride                                      |
| kg               | Kilogram  |
| LC               | Liquid chromatography                                   |
| LD <sub>50</sub> | Lethal dose 50%   |
| LOD              | Limit of detection                                      |
| LSD              | Least significant difference                            |
| MCL              | maximum contaminant level                               |
| Mg               | Magnesium   |
| mg               | Milligram   |
| mg/kg            | milligrams per kilogram (equivalent to ppm)             |
| mg/L             | Milligram per litre                                     |
| mL               | Milliliter  |
| mM               | Millimolar  |
| MMA              | monomethylarsonic acid                                  |

## ABBREVIATIONS AND SYMBOLS (CONTINUED)

|                   |   |
|-------------------|---|
| MSM               | monosodium methanearsonate, the sodium salt of MMAA |
| N                 | Nitrogen  |
| Na-As(III)        | Sodium arsenite                                     |
| nd                | below analytical detection limit                    |
| ng/m <sup>3</sup> | Nanogram per cubic meter                            |
| O                 | Oxygen  |
| -OH groups        | Hydroxyl groups                                     |
| OM                | Organic matter                                      |
| OM                | Organic matter                                      |
| P                 | Phosphorus  |
| Pb                | Lead  |
| PGPM              | Plant growth promoting microorganisms               |
| PGPR              | Plant growth-promoting rhizobacteria                |
| pH                | Potential of hydrogen ion                           |
| ppm               | parts per million (equivalent to mg/kg)             |
| PSB               | Phosphate solubilizing bacteria                     |
| PVK               | Pikovskaya's  |
| RNA               | Ribonucleic acids                                   |
| rpm               | Round per minute                                    |
| S                 | Sulfur  |
| Tr                | Treatments  |
| U.S. EPA          | The United State Environmental Protection Agency    |
| USEPA             | United States Environmental Protection Agency       |
| UV                | Ultraviolet   |
| UV-vis            | Ultraviolet-visible                                 |
| WHO               | World Health Organization                           |
| μg                | Microgram   |
| μM                | Micromole   |



## ข้อความแห่งการริเริ่ม

ข้าพเจ้าขอรับรองว่าวิทยานิพนธ์ฉบับนี้เป็นผลงานวิจัยริเริ่มยกเว้นในกรณีเอกสารอ้างอิงข้าพเจ้า  
ขอรับรองว่าวิทยานิพนธ์นี้ไม่ได้ละเมิดลิขสิทธิ์กรรมสิทธิ์และเทคนิคใดๆจากการทำงานของคนอื่นๆ  
และผลงานของข้าพเจ้านี้ไม่ได้ถูกส่งไปเพื่อขอประกาศนียบัตรหรือปริญญาบัตรจากสถาบันอื่นๆของ  
ระดับการศึกษาที่สูงขึ้น



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## STATEMENTS OF ORIGINALITY

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