

2nd Annual Congress onENVIRONMENTAL POLLUTION AND HEALTH HAZARDS
October 22-23, 2018 Osaka, Japan**Recovering ammonia from ammonia-rich wastewater by vacuum stripping using a rotating packed bed**Min-Hao Yuan¹, Yi-Hung Chen² and Yu-Kai Wang²¹China Medical University, Taiwan²National Taipei University of Technology, Taiwan

Since the more stringent regulations on ammonia for industrial wastewater has implemented, recovery of ammonia from ammonia-rich wastewater has attracted much attention because of the idea of a circular economy. For example, the practice of semiconductor industry by using membrane distillation has generated solution of ammonium sulfate ((NH₄)₂SO₄) more than 2000 tons/month by a company. However, (NH₄)₂SO₄ can be re-used for only industrial propose, resulting in shortcoming in their circular economy route. This study employs vacuum stripping using a Rotating Packed Bed (RPB) to recover ammonia from ammonium sulfate wastewater into a high quality of anhydrous ammonia (Anhydrous NH₃) and sodium sulfate (NaSO₄), which both anhydrous NH₃ and NaSO₄ have a wide variety of industrial uses. The results showed that the required operation time to achieve removal efficiency above 90% and concentration of NH₄-N below 5000 ppm has been reduced from 12 to 8.3 h at the initial condition of 2000 L/day (2.08 tons/day) and initial NH₄-N concentration of 60,000-70,000 ppm, temperature of 55 °C and pH>13. Therefore, this study provides a new pathway for circular economy solutions for high-quality ammonium products recovered from the ammonia-rich industrial wastewater.

Biography

Min-Hao Yuan has received his PhD in Environmental Engineering from National Taiwan University in 2011. He has also been trained from the leading universities in Japan, University of Tokyo and Tokyo Institute of Technology and the University of Michigan-Ann Arbor, USA. He was also awarded several merit-based fellowships from Taiwan, Japan and USA. He is currently working as an Assistant Professor in Department of Occupational Safety and Health, China Medical University. His research focus is about green technology and safety science with a wide range of green technology, cleaner production and safety engineering for sustainable energy industries and pollution prevention.

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