



HKUST-CIL Joint Laboratory of Innovative  
Environmental Health Technologies



# GERMAGIC Thyme Ammonia Suppression Test Report



Prepared by LEE Jong Hong (Winsor) and LAI Yue Tak (Donald) on 29<sup>th</sup> July 2019

## Abstract

- Aim:** To investigate the suppression ability of GERMAGIC Thyme in ammonia gas generation situations, such as soiled toilets.
- Results:** GERMAGIC thyme can suppress ammonia gas generation by near 70% in 10 minutes.

## Methodology

### 1. Parameters

- 1.1 Test sample: GERMAGIC Thyme Disinfection Spray
- 1.2 Detector: SmartSensor® Ammonia Gas Detector AR8500
- 1.3 Equipment: Duran™ Borosilicate Glass 3.3 Vacuum Desiccator with NOVUS NS-Tube in Lid (Volume: ~0.7L)  
SPL 60mm Polystyrene Petri Dish (Cat. No. 10060)
- 1.4 Test venue: Hong Kong University of Science and Technology
- 1.5 Test date: July, 2019
- 1.6 Operator: Mr. LEE Jong Hong (Winsor)

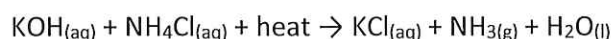
### 2. Procedure

- 2.1. Prepare a desiccator with taper stopcock on top for gas collection.
- 2.2. Drop 2ml 50ppm ammonium chloride and 2ml 1M potassium hydroxide into desiccator with a petri dish as holder.
- 2.3. Use water bath to heat the desiccator up to 70°C for 10 minutes.
- 2.4. Place sensor on the mouth of the desiccator and measure for 5 minutes, record the maximum value.
- 2.5. Remove the desiccator lid. For test, spray test sample twice (full spray). For control, nothing is sprayed. Place back the desiccator lid.
- 2.6. After 10 minutes, place sensor at the mouth of the desiccator and measure for 5 minutes, record the maximum value.

Chemical reaction:



It is a reversible double replacement reaction. However, ammonia gas is released from ammonium hydroxide upon heating. Thus, the reaction equation with heating would be:



## Results

	Initial Conc, $C_{C,0}$ (ppm)	Final Conc, $C_{C,E}$ (ppm)	$C_{C,0} - C_{C,E}$ (ppm)	Reduction Rate (%)
Control 1	32.5	27	5.5	16.92
Control 2	25.6	19.8	5.8	22.66
Control 3	26.7	23	3.7	13.86
Average Reduction Rate, $RR_A$ :				17.81
	Initial Conc, $C_{T,0}$ (ppm)	Final Conc, $C_{T,E}$ (ppm)	$C_{T,0} \times (1 - RR_A)$	Suppression Rate (%)
Treatment 1	30.5	8.2	25.07	67.29
Treatment 2	25.1	4.8	20.63	76.73
Treatment 3	24.1	7.2	19.81	63.65
<b>Average Suppression Rate, <math>SR_A</math>:</b>				<b>69.22%</b>

Note:

$C_{C,0}$  is initial maximum reading of ammonia gas for control

$C_{C,E}$  is final maximum reading of ammonia gas for control

$C_{T,0}$  is initial maximum reading of ammonia gas for test

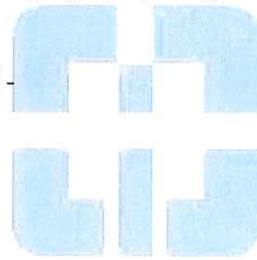
$C_{T,E}$  is final maximum reading of ammonia gas for test

Reduction Rate =  $(C_{C,0} - C_{C,E}) / C_{C,0} \times 100\%$

Suppression Rate =  $((C_{T,0} \times (1 - RR_A)) - C_{T,E}) / (C_{T,0} \times (1 - RR_A)) \times 100\%$



- End -





香港科技大學-捷和實業有限公司  
創新環境健康技術聯合實驗室



# 菌魔力百里香消毒噴霧劑 抑制氨氣功效測試報告



由 LAI Yue Tak (Donald) 於二零一九年八月七號 編寫



## 摘要

目的: 評估菌魔力百里香消毒噴霧劑在骯髒場所抑制氨氣產生的功效。

結果: 菌魔力百里香消毒噴霧劑可在 10 分鐘內抑制近 70% 的氨氣。

## 方法

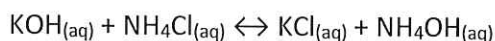
### 1. 參數

- 1.1 測試樣品: 菌魔力百里香消毒噴霧劑
- 1.2 檢測儀器: 希瑪氨氣檢測儀 AR8500
- 1.3 測試設備: Duran™ 硼硅真空乾燥器連 NOVUS 接頭閥門 (~0.7 升)  
SPL 60mm 著苯乙烯培養皿
- 1.4 測試地點: 香港科技大學
- 1.5 測試日期: 2019 年 7 月
- 1.6 操作人: LEE Jong Hong (Winsor) 先生

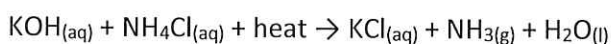
### 2. 步驟

- 2.1 準備乾燥器連接頭閥收集氣體。
- 2.2 於乾燥器內放置培養皿，並在培養皿上加 2 毫升 50ppm 氯化氨和 2 毫升 1M 氫氧化鉀液體。
- 2.3 利用水浴把乾燥器的溫度提升至攝氏 70 度，並放置 10 分鐘。
- 2.4 把氨氣檢測儀對準乾燥器的接頭閥門，並收集數據 5 分鐘，紀錄最高讀數。
- 2.5 打開乾燥器蓋子。進行實驗組時，噴塗測試樣品液體兩次(全按)。進行對照組時，不用噴塗。蓋回蓋子。放置 10 分鐘。
- 2.6 把氨氣檢測儀對準乾燥器的接頭閥門，並收集數據 5 分鐘，紀錄最高讀數。

化學反應:



這是一個可逆的替代反應。不過加熱後，氨氣會從氫氯化氨中釋放出來。所以加熱後的化學反應為:





## 結果

	初始濃度, $C_{C,0}$ (ppm)	最終濃度, $C_{C,E}$ (ppm)	$C_{C,0} - C_{C,E}$ (ppm)	下降率 (%)
對照組 1	32.5	27	5.5	16.92
對照組 2	25.6	19.8	5.8	22.66
對照組 3	26.7	23	3.7	13.86
平均下降率, $RR_A$ :				17.81
	初始濃度, $C_{T,0}$ (ppm)	最終濃度, $C_{T,E}$ (ppm)	$C_{T,0} \times (1 - RR_A)$	抑制率 (%)
實驗組 1	30.5	8.2	25.07	67.29
實驗組 2	25.1	4.8	20.63	76.73
實驗組 3	24.1	7.2	19.81	63.65
平均抑制率, $SR_A$ :				<b>69.22%</b>

註:

$C_{C,0}$  是對照組的初始氨氣最大讀數

$C_{C,E}$  是對照組的最終氨氣最大讀數

$C_{T,0}$  是實驗組的初始氨氣最大讀數

$C_{T,E}$  是實驗組的最終氨氣最大讀數

下降率的計算方法:  $RR = (C_{C,0} - C_{C,E}) / C_{C,0} \times 100\%$

抑制率的計算方法:  $SR = ((C_{T,0} \times (1 - RR_A)) - C_{T,E}) / (C_{T,0} \times (1 - RR_A)) \times 100\%$

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