

UNIVERSITI TEKNOLOGI MARA

**EFFECTS OF HIGH TEMPERATURE ON
FORMALDEHYDE AND ANTIMONY LEVELS IN
POLYETHYLENE TEREPHTHALATE (PET)
BOTTLED MINERAL WATER**

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Declaration by Student

Project entitled "Effects of high temperature on formaldehyde and antimony levels in Polyethylene Terephthalate (PET) bottled mineral water is a presentation of my original research work. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Assoc. Prof. Dr.Hazilia binti Hussain as Project Supervisor. It has been submitted to the Faculty of Health Sciences in partial fulfillment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons.)

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Abstract

Effects of High Temperature on Formaldehyde and Antimony Levels in Polyethylene Terephthalate (PET) Bottled Mineral Water

Nur Suhaila Binti Mohd Pilus

INTRODUCTION: Mineral water is one of the popular choice for all. Occasionally, this bottle of mineral water would be left in a hot car and would result in the leaching of metal such antimony and carbonyl compound such formaldehyde. **OBJECTIVE:** The aim of this study were to determine the levels of formaldehyde and antimony in mineral water bottle (PET) due to in-car storage exposure and it health impact to public. **METHODOLOGY:** The data were collected regarding on the concentration of formaldehyde and antimony in the PET mineral water bottle for one and two weeks exposure. Those sample were stored in the car for two weeks. The concentration for both compound also been tested before storage. Besides that, the storage temperature factor also been taken over time which three times per day until the study was done. The GFAAS and UV-VIS were used for analyzed the concentration of antimony and formaldehyde respectively. The quantitative risk assessment was used for health risks analysis. **FINDINGS.** The mean concentration for formaldehyde slightly increased the in-car storage duration which are before storage, one week storage and two week storage for each brands. It aslo been proven that the leaching happened after the samples were stored in the car as there is no result before storage. However, all results were below the WHO standard which is 0.9mg/L. The formaldehyde concentration and different storage duration only have a fair correlation ($r=0.502$) while poor correlation ($r=0.214$) between the formaldehyde concentration and different brands. The antimony also below the WHO standard; 0.02mg/L. Nonetheless, the mean concentration of antimony was slightly increased by the in-car storage duration which are before storage, one week storage and two week storage for each brands same like formaldehyde. The antimony concentration and different storage duration only have a poor correlation ($r=0.228$) while poor correlation ($r=0.071$) between the antimony concentration and different brands. **CONCLUSION:** There are few factors that could cause the leaching which are temperature, sunlight irradiation, storage duration and the influence of the manufacturing technology and bottling process. The migration of this leaching compound may cause potential effect to consumer.

Keywords: Leaching, formaldehyde, antimony, health risk assessment