

UNIVERSITI TEKNOLOGI MARA

**LEACHING OF BISPHENOL (A) INTO DRINKING
WATER IN POLYCARBONATE (PC) BOTTLES**

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Declaration by Student

Project entitled "Leaching of bisphenol (A) into drinking water in polycarbonate (PC) bottles " 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 Mr. Hashim bin Ahmad 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

Leaching Of Bisphenol (A) Into Drinking Water In Polycarbonate Bottles

Nur Munirah Binti Mustafa

A study on leaching of bisphenol (A) into drinking water in polycarbonate bottles has been showed. Nowadays, the method of choice for most people is to carry around trendy, colorful plastic filled with water that is generally made from polycarbonate plastics. There are seven classification of plastic identified with the code system, yet many marked with PC or 7, because it is cheaper to produce. Bisphenol (A) is a chemical compound used in industrial chemical to create polycarbonate plastic and epoxy resins. Bisphenol (A) derived plastics, commercially produced since the 1950s, have become ubiquitous because of their shatter resistance, visual clarity, high heat resistance, and electrical resistance. The main objective of this study is to calculate the potential health risk of Bisphenol (A) detection in drinking water in polycarbonate (PC) bottles. 36 samples of reverse osmosis drinking water packaged in polycarbonate (PC) and Polyethelene Terephthalate (PET) of different brands supplied from Puncak Alam markets for screening work of BPA. There are 4 different brand of drinking bottles used for specific migration investigation of BPA during 14 days of storage at three different conditions; exposure to sunlight in car, chilling and room temperature. BPA concentration was determined by High Performance Liquid Chromatography (HPLC). The analysis of health risk assessment is done by distributed questionnaires and calculated of chronic daily intake (CDI). The standard level of BPA by Health Canada (2009) is $1.5 \mu\text{g/L}$ in average. Brand A of polycarbonate (PC) bottles has exceeded the standard level of BPA with 1.5307 ± 0.2325 , meanwhile all the readings in Polyethylene Terephthalate (PET) bottles shows below the average standard. Polycarbonate (PC) bottles with median 0.76150 (0.934) tends to migrate more of BPA into drinking water than Polyethylene Terephthalate (PET) bottles with median 0.63650 (1.018). Both types of bottles had a reading of BPA in exposure to sunlight conditions for storage in car with median of polycarbonate is 0.6365 (1.018), and for the Polyethylene Terephthalate (PET) is 0.6365 (0.68789). The p-value of both bottles was significantly different; ($p < 0.05$). There is no detection of BPA in chilling and room temperature conditions. It can be conclude that BPA migrates into water stored in polycarbonate (PC) bottles, especially when heated at high temperatures. Relatively, high levels of Bisphenol (A) are found to release into drinking water at exposure to sunlight conditions.

Keywords: Bisphenol (A), drinking water, polycarbonate (PC) bottles, Polyethylene Terephthalate (PET) bottles, exposure to sunlight.