

Abstract

Benzene, Toluene, Ethylbenzene and Xylene (BTEXs) are ubiquitous volatile organic compounds that have smell, but have no color. They are known to be leading cause of irritation to eyes, throat, nasal, and skin. In addition, occupants can have leukemia if they are exposed to BTEXs for a long period of time. As a result, BTEXs have been recognized as one of the most hazardous indoor air pollutions.

Human's exposure to BTEXs group ranges depend on building types, user's behavior, and type of building materials. BTEXs are parts of surface coating such as interior paint, oil-based paint, and lacquer, those are found in most of Thailand's building.

The objectives of this research are to study concentration of BTEXs group emitted from painted gypsum board and to study the reduction of BTEXs by using King of Hearts and Peace Lily in order to improve indoor air quality (IAQ).

The study is divided into two parts. The first part focuses on the study of BTEXs emission from interior paints. The second part focuses on the study of the reduction of BTEXs by indoor plants: King of Hearts and Peace Lily. The experiments use Gasmet DX-4015 FTIR as an assessment tool.

From the first part, the experimental results show that Benzene of concentration of higher than 0.5 ppm presents a risk to human's exposure, according to TLV and TWA standards. The concentrations of Toluene, Ethylbenzene, m-Xylene and p-Xylene, are acceptable at 50 ppm, 100 ppm, 100 ppm, and 100 ppm, respectively. The experimental result also shows the absence of o-Xylene.

The result from the second part demonstrates that the selected interior plants are capable of reducing BTEXs, especially Toluene. However, they do not reduce Benzene's concentration to its acceptable levels (TLV and TWA standards). The suggestion is to add more of these interior plants in order to decrease the concentrations of Benzene to the acceptable level.

From this study, it is found that the selected interior plants encourage solving IAQ problem. This research is particularly beneficial to the buildings with inadequate ventilation.