1.1 Background

Flavor is one of the most important attributes that determines the acceptance of food. Flavor results from compounds of two broad classes: those responsible for taste and those responsible for odors or often called as aroma substances. Aroma substances are volatile compounds that are perceived by the odor receptor sites of the smell organ (Pawliszyn and Lord, 2010; Belitz et al., 2009).

According to Badan Pusat Statistik (2010), the production of citrus is the second highest of fruit production in Indonesia after banana. The main reasons for the major production of citrus are their desirable and refreshing flavor. Citrus is one of the most appreciated flavors for soft drinks and confectionery and is accepted all over the world (Deibler and Delwiche, 2004). According to Wijaya (2010), there are various species of citrus that can be cultivated in Indonesia including oranges, mandarins, pomelos, citrons, lemons, limes, and kumquats.

Some citrus species that have been recognized and cultivated by Indonesian people include jeruk limau (Citrus amblycarpa Hassk.), jeruk purut (Citrus hystrix DC.), and jeruk nipis (Citrus aurantifolia Christm.). These types of citrus were still minimally applied as spices and condiments for home-made dishes and sambal in Indonesia as well as medical treatments. Each of
these citruses has distinctive aroma from one another and therefore the applications of these citruses in foods also differ. These three citrus species are to be analyzed in term of their volatile components with Gas Chromatography-Mass Spectrometry (GC-MS) and sensory profiles with Qualitative Descriptive Analysis (QDA).

1.2 Research Problem

Volatile compounds are responsible for giving fruit its characteristic aroma. *Jeruk limau* (*Citrus amblycarpa* Hassk.), *jeruk purut* (*Citrus hystrix* DC.), and *jeruk nipis* (*Citrus aurantifolia* Christm.) are having different aroma from one another; however, there has been no report regarding the compounds contributing to the distinct aroma possessed by these citruses and thus it is required to be analyzed.

1.3 Objectives

1.3.1 General Objectives

This project aimed to compare the aroma profiles of *jeruk limau* (*Citrus amblycarpa* Hassk.), *jeruk purut* (*Citrus hystrix* DC.), and *jeruk nipis* (*Citrus aurantifolia* Christm.) as well as their preferred applications in foods.

1.3.2 Specific Objectives

This project aimed to:

1) Compare the aroma profiles of *jeruk limau* (*Citrus amblycarpa* Hassk.), *jeruk purut* (*Citrus hystrix* DC.), and *jeruk nipis* (*Citrus aurantifolia* Christm.) as well as their preferred applications in foods.
Christm.) in term of their volatile compounds analyzed by Gas Chromatography-Mass Spectometry (GC-MS).

2) Compare the aroma profiles of jeruk limau (Citrus amblycarpa Hassk.), jeruk purut (Citrus hystrix DC.), and jeruk nipis (Citrus aurantifolia Christm.) in term of their sensory profiles by Quantitative Descriptive Analysis (QDA).

3) Compare the results of both volatile compounds and sensory profile analyses.

4) Find the preferred applications of each citrus in foods based on their aroma profiles by using open-ended questions.