

UNIVERSITI TEKNOLOGI MARA

**DETERMINATION OF ANTIOXIDANT ACTIVITY OF
SCHIFF BASES SYNTHETIC COMPOUNDS
BY USING FERRIC REDUCING ANTIOXIDANT POWER
(FRAP) ASSAY**

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ABSTRACT

The use of antioxidant in daily life can give many beneficial effects. It can scavenge free radicals released by oxidation and thus protects the cell from damage cause by the free radicals. Antioxidants can be found in both natural and synthetic compound. The Schiff bases synthetic compounds are an important class of organic compound that have intensive range of biological activities and industrial application. They have been found to have many beneficial pharmacological activities such as antibacterial, antifungal, anticancer, antiHIV, antitubercular, antiviral, anti-inflammatory and others. This study is conducted to determine the antioxidant activity of Schiff bases synthetic compounds by using ferric reducing antioxidant power (FRAP) assay. The aim of this study is to detect how many compounds from 27 Schiff bases synthetic compounds that will give high antioxidant activity by using FRAP assay. The principle of FRAP assay is antioxidant activity will reduce Fe^{3+} to Fe^{2+} that will develop an intense blue color. The Fe^{2+} formed may interact with 2,4,6-tris(2pyridyl)-*s*-triazine (TPTZ) and will give a strong absorbance at 593 nm. 27 Schiff bases synthetic compounds have been tested using this assay with the use of gallic acid as the positive control. FRAP value of the samples are measured and compared with the FRAP value of gallic acid to determine the potential of antioxidants activity of the compounds.

CHAPTER 1

INTRODUCTION

1.1 Antioxidant

The use of antioxidant in daily life can give many beneficial effects such as delay the aging process and prevent oxidative stress. Antioxidant can be defined as a chemical that can prevent the oxidation of other chemicals. Oxidation is defined as the process that will form free radicals which consist of unpaired electron thus make it unstable and reacts actively with other molecules. The antioxidant can reduce the rate of lipid oxidation in various biological systems besides delay, prevent or get rid of damage cause by oxidation to a target molecule (Halliwell, 2007). Its function also to scavenge free radicals released by oxidation and thus protects the cells from damage caused by the free radicals (Han and Xu, 2009). Free radicals are very unstable molecules that creating reactive oxygen species (ROS), reactive nitrogen species (RNS) and reactive sulphur species (RSS) (Carocho & Ferreira, 2013). Usage of antioxidant also can help to reduce the oxidative stress that happened when there is imbalance between the pro-oxidant reactive species and antioxidant molecules that cause excessive production of ROS (Wiernsperger, 2003; Jansen & Ruskovska, 2013).

The antioxidants can be found in both natural and synthetic compound. There are two major groups of antioxidant which are enzymatic and non enzymatic which can help to prevent or