

CHAPTER 1

INTRODUCTION

Next to diamond, corundum is the most important gemstone. The species name *corundum*. Rubies are defined as the red variety of the mineral corundum. Corundum of any other color is called sapphire. Color is the most important determinant of value in colored gemstones. However the appearance of the color of the gemstone is affected by many variables that make it difficult to evaluate precisely. Accurate color description and color matching (as perceived by the human eye and interpreted by the brain) in faceted transparent corundum is quite a difficult, subjective and debatable process. This is because these corundum are tri-dimensional substances, characterized by dichroism, refraction, inclusions, fluorescence and other parameters that greatly influence their color appearance. Accurate color description in corundum as well in all gems, also depends upon the observer's visual spectral responsiveness, the lighting conditions during color perception, and other factors. ⁽¹⁾

However color is an important property of colored gems that has been used in communication. Color description in gemstones has not been standardized among gem dealers, neither is any system universally accepted, although several color gemstone systems have been introduced in the gem and jewelry industry since the early 1980's. In this research, the distribution of the color comparators in the well-documented and widely used Munsell system along three color attributes (hue, tone, and saturation) is relatively easy to understand and communicate, which helps its application for this purpose. The color communication system is accepted and used by various industries .

This research investigates the color characteristics of ruby and blue sapphire by matching with the color chip of the Munsell System, and then the data is correlated to the color system giving the color characteristics of ruby and blue sapphire through the visual sensation in the CIELUV color system.

1.1 Objectives

To be a trend for evaluating and classifying the color quality of rubies and blue sapphires.

1.2 Scope of the Research

The research effort regarding the subjective ruby and blue sapphire color that was each stone in the color quality classification was assigned a Munsell color code and name. The results were converted into the color coordinates of the CIELUV and CIELAB color systems.

1.3 Content of the Thesis

Chapter 2 contains the overview of the theoretical considerations and literature reviews that are related to this research. Chapter 3, the description on materials under study and the experimental procedure and apparatus. Chapter 4, the results and discussion on the visual evaluation, the color perception values on CIE1976 uniform chromaticity scale diagrams, and CIE L* a* b* diagrams. Finally the conclusion and suggestion come in Chapter 5.

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