

CHAPTER 4

Conclusion

The research indicates that the developed system that using smartphone camera for taking photograph of the colored solution in well plate is successful of the evaluation of antioxidant capacity by DPPH assay. The proposed method provided rapid and high throughput analysis for evaluation of antioxidant capacity. Conditions for taking photograph in a light controlled condition could be efficiency employed to improve precision of the method. Photograph of the well plate was taken and the image obtained was analyzed for RGB color intensity by the developed software, of which the procedure of analysis was completed within 15 minutes. Calibration graph was created by plotting green color intensity of a series of Trolox solutions (10-130 μM). The wide linear range and low detection limit 0.9 μM were achieved. Comparison of the results showed good correlation between the antioxidant capacity measured by the proposed method and by the conventional spectrophotometric method. The results obtained from both the methods were not significantly different, according to examination of the t-test at 95% confidence level. The developed system provided high precision for the analysis of 10 μM Trolox ($n = 11$) ($\text{RSD} < 5\%$) and high inter-day precision ($\text{RSD} < 2\%$) for the analysis in 3 days. The system showed the performance of colorimetric detection in terms of good precision, high sensitivity, wide linear range, and low detection limit.

The proposed method provided fast, simple, low-cost, low reagent consumption, low chemical waste generation, and easy operation, which is suitable for routine analysis of antioxidative activity in real samples. Although the system has been demonstrated for antioxidant capacity assay, it can be applied in other colorimetric among too. The developed system can be applied for screening assays and drug discovery research in future. Despite the simple and low-cost instrument was employed, high sample throughput and good analytical performances were achieved. Therefore, the new method should be reduce time consuming process and involves very complex.