REFERENCES

English

Abdalla, A. E., and Roozen, J. P. 1999. Effect of plant extracts on the oxidative stability of sunflower oil and emulsion, Food Chemistry 64: 323-329.

Asano, T., T. Okada. 1984. Thermal Z-E Isomerization of Azobenzenes. The Pressure, Solvent, and Substituent Effects. J. Org. Chem. 49: 4387.

Axtell , B.L., and Fairman R.M. 1992 .Minor oil crops. FAO agricultural services bulletin no. 94. [Online]. Available from: http://www.fao.org/docrep/x5043e/x5043E00.htm

Bachmann, J., 2004. Oilseed Processing for Small Scale Producers [Online]. Available: http:// www.attra.ncat.org

Becher, P. 1965. Emulsions: Theory and Practice. 2nd edit. U.S.A.: Reinhold Publishing.

Bibart, C. H. 1979. Stability testing for expiration dating. Drug Development and Industrial Pharmacy 5:349-363.

Bondet, V., Brand, W., and Berset, C. 1997. Kinetics and mechanisms of antioxidant activity using the DPPH• free radical method, Lebensmittel-Wissenschaft und -Technologie/Food Science and Technology 30: 609-615.

Brand, W., Cuvelier, M. E., and Berset, C. 1995. Use of a free radical method to evaluate antioxidantactivity, Lebensmittel-Wissenschaft . Technologie/Food Science and Technology 28: 25-30.

Brenes, M., García, A., Dobarganes, M. C., Velasco, J., and Romero, C. 2002.Influence of thermal treatments simulating cooking processes on the polyphenol content in virgin olive oil. Journal of Agricultural and Food Chemistry 50, 21: 5962-5967.

Bucci, R., Magrì, A., D., Magrì, A. L., and Marini, F. 2003. Comparison of three spectrophotometric methods for the determination of γ-oryzanol Bergman, C. J., and Xu, Z. 2003. Genotype and Environment Effects on Tocopherol, Tocotrienol,and gamma-Oryzanol Contents of Southern U.S. Rice. Cereal Chem. 80, 4: 446–449

Blois, M. S., 1958. Antioxidant determinations by the use of a stable free radical, Nature 1199-1200.

Buchmann, S. 2001. Main cosmetic vehicle. Handbook of cosmetic science and technology 145-154,774-775

Cicero, A. F. G., and Gaddi, A. 2001. Rice bran oil and γ-oryzanol in thetreatment of hyperlipoproteinemias and other conditions. Phytother.Res. 15: 277–289.

Chen, M. H., and Bergman, C. J. 2005. A rapid procedure for analyzing rice bran tocopherol,tocotrienol and γ -oryzanol contents. Journal of Food Composition and Analysis 18: 319–331

Cheruvanky, R. 2000. Bioactives in rice bran and rice bran oil. In W. R. Bidlack, S. T. Omye, M.S. Meskin, an D.K. Topharn (eds.), Phytochemicals as bioactive agents pp.213-240. USA: Technomic publishing.

Dasgupta, N., and De B. 2004. Antioxidant activity of *Piper beltle* L. leaf extract *in vitro.* Food Chem. 88:219-224

Davis, S.S. Physicochemical criteria for semi-solid dosage forms. Stability testing of drug Product 40-54

Deckere, E. A. M., and Koever, O. 1996. Minor constituents of rice bran oil as functional foods. Nut. Rev. 54, 11:S120-S126

Diack, M. and Saskq, M.1994. Separation of Vitamin E and gamma-Oryzanol from Rice Bran by Normal-Phase Chromatography. Journal of American Oil Chemists & Society 71,121: 1-1217.

Enochian, R.V., Saunders, R.M., Schultz, W.G., Beagle, E.C. and Crowley, P.R. 1980 Stabilization of Rice Bran with Extruder Cookers and Recovery of Edible Oil: A Preliminary Analysis of Operational and Financial Feasibility. Dept. of Agriculture Marketing Research

Ertel, K. D., & Carstensen, J. T. 1990. Examination of a modified Arrhenius relationship for pharmaceutical stability prediction. InternationalJournal of Pharmaceutics 61:9-14.

Espin, J.C., Soler, R. C., and Wichers, H.J. 2000. Characterization of the total free radical scavenger capacity of vegetable oils and oil fractions using 2,2-diphenyl-1-picrylhydrazyl radical. The American Chemical Society's Journal of Agricultural and Food Chemistry 48:648-656.

Ertel, K. D., & Carstensen, J. T. 1990. Examination of a modified Arrhenius relationship for pharmaceutical stability prediction. International Journal of Pharmaceutics 61: 9-14.

Fang, N., Yu, S., and Badger, T.M. 2003. Characterization of Triterpene Alcohol and Sterol Ferulates in Rice Bran Using LC-MS/MS. J. Agric. Food Chem. 51: 3260-3267.

Fujita, A., Masumoto, K., Kawakami, K., 2006. Anti-oxidant Activity of various Rice Bran. J. Oleo Sci. 55, 11: 585-591

Garrett, E. R. 1962. Prediction of stability of drugs and pharmaceutical preparations. Journal of Pharmaceutical Sciences 51: 811-833.

Garrett, E. R., & Carper, R. F. 1955. Prediction of stability in pharmaceutical preparations I. Color stability in a liquid multisulfa preparation. Journal of the American Pharmaceutical Association (Scientific Edition) 44, 515-518.

Grimm, W.1985. Stability testing in industry. Stability testing of drug products 156-169

Hemavathy, J., and Prabhakar, J. V.1987. Lipid composition of rice (Oryza sativa L.) bran. J.Am. Oil Chem. Soc.64, 7:1016-1019

Hirose, M., Fukushima, S. Imaida, K., Ito, N., and Shirai, T. 1999.Modifying effects of phytic acid and gamma-oryzanol on the promotion stage of rat carcinogenesis. Anticancer Res. 19, 5:3665-3670

Hung, C. J. Potential functionality and digestibility of oryzanol as determined using in vitro cell culture models . Doctor of Philosophy'dissertation Louisiana State University and Agricultural and Mechanical College

Iijima, T. and Sano, H. 1986. U.S. patent. 4,612,187. Nissin Chemical Co.,Ltd

Iqbal, S., Bhanger, M. I., and Anwar, F. 2005. Antioxidant properties and components of some commercially available varieties of rice bran in Pakistan. Food Chemistry 93:265–272

Juliano, B.O., and Bechtel, D. B. 1985. The rice grain and its gross composition. Rice Chemistry and Technology 17-57

Juliano, C., Cossu, M., Alamanni, M. C., and Piu, L. 2005. Antioxidant activity of γ-oryzanol: Mechanism of action and its effect on oxidative stability of pharmaceutical oils. International Journal of Pharmaceutics 299: 146–154

Karen, A.1998. Separation of oryzanol from crude rice bran oil. Master's Thesis, Department of Chemical Engineering University of Toronto

Kenneth, K. 2005. Cosmeceutical formulation considerations. Cosmeceuticals 19-22

Kim, J., Godber, J., King, J., and Prinyawiwatkul, W. 2001. Inhibition of cholesterol autoxidation by the nonsaponifiable fraction in rice bran in an aqueous model system. Journal of American Oil Chemists Society 78: 685–689.

Kochhar, S. P. 2002. Sesame, rice-bran and flaxseed oils. In F. D. Gunstone(ed.), Vegetable oils in food technology. pp. 297-326. USA: Blackwell publishing.

Lai, S. M., Hsieh, H.L., and Chang, C. W. 2005. Preparative Separation of g-Oryzanol from Rice Bran Oil by Silica Gel Column Chromatography. Journal of Liquid Chromatography & Related Technology 28: 145–160.

Lee, J., Koo, N., and Min, D.B. 2004. Reative oxygen species, aging, and antioxidative nutraceuticals. Comp.Rev.Food Sci.Food Saf. 3:21-33

Lloyd, B. J., Siebenmorgen , T. J., and Beers ,K.W. 2000 . Effects of Comercial Processing on Antioxidants in Rice Bran. Cereal Chem 77, 5: 551-555.

Lu, S.C. and Luh, S.B. 1991. Rice snack foods. Rice Production and Utilization 690-697

Lupo, M.P., 2001. Antioxidants and vitamins in cosmetics. Clin. Dermatol.19: 467–473.

Mccaskill, D., and Zhang, F. 1999. Use of rice bran oil in foods. Food Technology February 53, 2:50-53.

Magdassi, S., and Touitou, E. 1999. Cosmetic Science and Technology 19: 1-6

Marshall, W., and Wadworth, J.1994. Rice Science and Technology7, New York, USA: Marcel Dekker, 421 -438.

Mailer, R., 2006. Testing olive oil quality: chemical and sensory methods. Primefact 231

Miller, K.W., N.V. Reo, A.J.M. Schoot Uiterkamp, D.P. Stengle, T.R. Stengle, K.L. Williamson. 1981. Xenon NMR: Chemical Shifts of a General Anesthetic in Common Solvents, Proteins, and Membranes. The National Academy of Sciences 78: 4946-4949.

Miller, M., F.M. Angeles, B.K., Reuter, P. 2001. Dietary antioxidants protect gut epithelial cells from oxidant-induced apoptosis. BMC Complementary and Alternative Medicine 1:11.

Molyneux, P. 2004. The use of the stable free radical diphenylpicrylhydrazyl (DPPH) for estimating antioxidant activity Songklanakarin. J. Sci. Technology. 26, 2: 211-219

Moreau, R., Powell, M., Singh, V. 2003. Pressurized Liquid Extraction of Polar and Nonpolar Lipids in Corn and Oats with Hexane, Methylene Chloride, Isopropanol, and Ethanol. Journal of American Oil Chemist' Society. 80: 1063-1067.

Nanua, J. N., McGregor, J. U., and Godber , J. S. 2000. Influence of High-Oryzanol Rice Bran Oil on the Oxidative Stability of Whole Milk Powder. J Dairy Sci 83: 2426–2431

Nissiotis, M., and Tasioula-Margari, M. 2002. Changes in antioxidant concentration of virgin olive oil during thermal oxidation. Food Chemistry 77, 3: 371-376.

Orthoefer, F.T. 1996. Rice Bran Oil: Healthy Lipid Source. Food Technology 62-64

Oufnac, D.S., Xu, Z., Sun, T., Sabliov, C., Prinyawiwatkul, W., and Godber J. S. 2007. Extraction of antioxidants from wheat bran using conventional solvent and microwave-assisted methods. Cereal Chemistry 84, 2:125

Perretti, G, Miniati, E, Montanari, L, and Fantozzi, P, 2003. Improving the value of rice by-products by SFE. J. of Supercritical Fluids 26: 63-71

Polo, K. F. 1998. A short textbook of cosmetology. 1 st ed. Germany; Verlag fur chemische industrie.

Priprem, A., Chitropas, P., Mahakunakorn, P., Khamlert, C., and Sripanidkulchai, Study on antioxidant of extracts from rice bran tablets compared with others

Prakash, A., 2001. Antioxidant activity. Analytical progress Takes you into the Heart of a Giant Resource19, 2.

Qureshi, A.A., Salser, W.A., Parmar, R., and Emeson, E.E. 2001. Novel Tocotrienols of Rice Bran Inhibit Atherosclerotic Lesions in C57BL/6 ApoE-Deficient Mice. J. Nutr.131: 2606-2618.

Rieger, M. M. 1994. Cosmetic use of selected natural fats and oils. Cosmet. Toiletries 109:57-68

Rodrigues, C., Onoyama , M. M., and Meirelles , A. J. A., 2006. Optimization of the rice bran oil deacidification process by liquid–liquid extraction. Journal of Food Engineering 73: 370–378

Rong, N., Ausman, L. M. and Nicolosi, R. J. 1997. Oryzanol Decrease Cholesterol Absorption and Aortic Fatty Streaks in Hamsters. Lipids 32, 3: 303-309.

Saunders, R.M. 1986. Rice bran: composition and potential food uses. Food Reviews International 1,3 : 465-95.

Sayre, R.N. 1988. Rice Bran as a Source of Edible Oil and Higher Value Chemicals,Western Regional Research Center, ARS, USDA.

Sayre, R.N. and Saunders, R.M. 1990. Rice Bran and Rice Bran Oil. Lipid Technology 2, 3:72-76

Seetharamaiah, G.S. and Prabhakar, J.V., 1986. Orytanol Content of Indian Rice Bran Oil and Its Extraction fiom Soap Stock, Journal of Food Science Technology 23,270-273.

Seetharamaiah, G. S. and Chandrasekhara,N., 1 989 . Studies on hypocholesterolemic activity of rice bran oil, Atherosclerosis 78,219.

Shimizu, M. and Ohta, G. 1957. Studies on the Constituents of Rice Bran Oil: II. Structure of Oryzanol-A, Pharm. Bulletin (Tokyo) 5, 40-44.

Shimizu, M. and Ohta, G. 1958. A New Triterpenoid Alcohol, 24-Methylene cycloartanol, as its Ferulate, from Rice Bran Oil, Pharm. Bulletin (Tokyo) .6,325-326.

Sugano, M. and Tsuji, E. 1997. Rice Bran Oil and Cholesterol Metabolism. J. Nutr. 127,3:521S-524S.

Tatsu, S., Tomohide, T., Kano, S., Yutaka, M., Takashi, H., Yoshiho, Y., and Sigemitsu, O.1993. J.P. patent 05,310,526.Eisai

Tamagawa, M., Otaki, Y., Takahashi,T., 1992 .Carcinogenicity Study of gamma-Oryzanol in B6C3F 1 Mice, Fd Chem. Toxic., 30,49-56.

Tadros, T.; Izquierdo, P.; Esquena, J.; Solans, C. 2004. Advances in Colloid&Int. Sci. 108-109, 303-318

Tsuchiya, T., and Kaneko, R. 1954 Separation of Oryzanol, J. Soc. Chem.57,526.

Van Amerongen, M. P.,Lievense,L. C., and van Ooten, C.W.2002. U.S.patent. 6,492,538. Lipton.

Xu, Z., and Godber, J.S. 1999. Purification and Identification of Components of γ-Oryzanol in Rice Bran Oil. J. Agric. Food Chem. 47: 2724-2728.

Yoon, S.H. and Kim, S.K.1994. Oxidative Stability of High-Fatty Acid Rice Bran Oil at Different Stages of Refining. Journal of the American Oil Chemists ' Society 71:227-229.

Yoshino, G., Kmrni, T., Amano, M.1989. Effccts of Gamma-Oryuurol and Probucol on Hyperlipidemia, Curr Ther. Res. 45: 975-982.

YU, B.P. 1999. Approaches to anti-aging intervention: the promises and the uncertainties. Mech Ageing Dev. 111: 73-87.

Thai

เกษร จันทร์ศิริ.2549 อิมัลชันทางเภสัชกรรม คณะเภสัชศาสตร์ มหาวิทยาลัยศิลปกร หน้า 45-62, 107-135

ฐาปนี ชูวรรณ , นฤมล จีรโชค, และ คณิต กฤษณังกูล ,2548. การวิเคราะห์ปริมาณแกมมาโอไรซานอลในไขสบู่จากโรงงานผลิตน้ำมันรำข้าว. วารสารวิจัยและพัฒนา มจธ. ปีที่ 28 ฉบับที่ 3 หน้า 321-327

วราพร พงษ์ธรกุลพานิช. 2543. การวิเคราะห์เอกลักษณ์และปริมาณโทโคฟีรอล และโอไรซานอล ใน กระบวนการผลิตน้ำมันรำข้าว.วิทยานิพนธ์ปริญาวิทยาศาตรมหาบัณฑิต สาขาวิชาเทคโนโลยีชีวเคมี มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี, กรุงเทพ .
หน้า 38, 50, 72-82

APPENDICES

APPENDIX A

DPPH Free Radical Scavenging

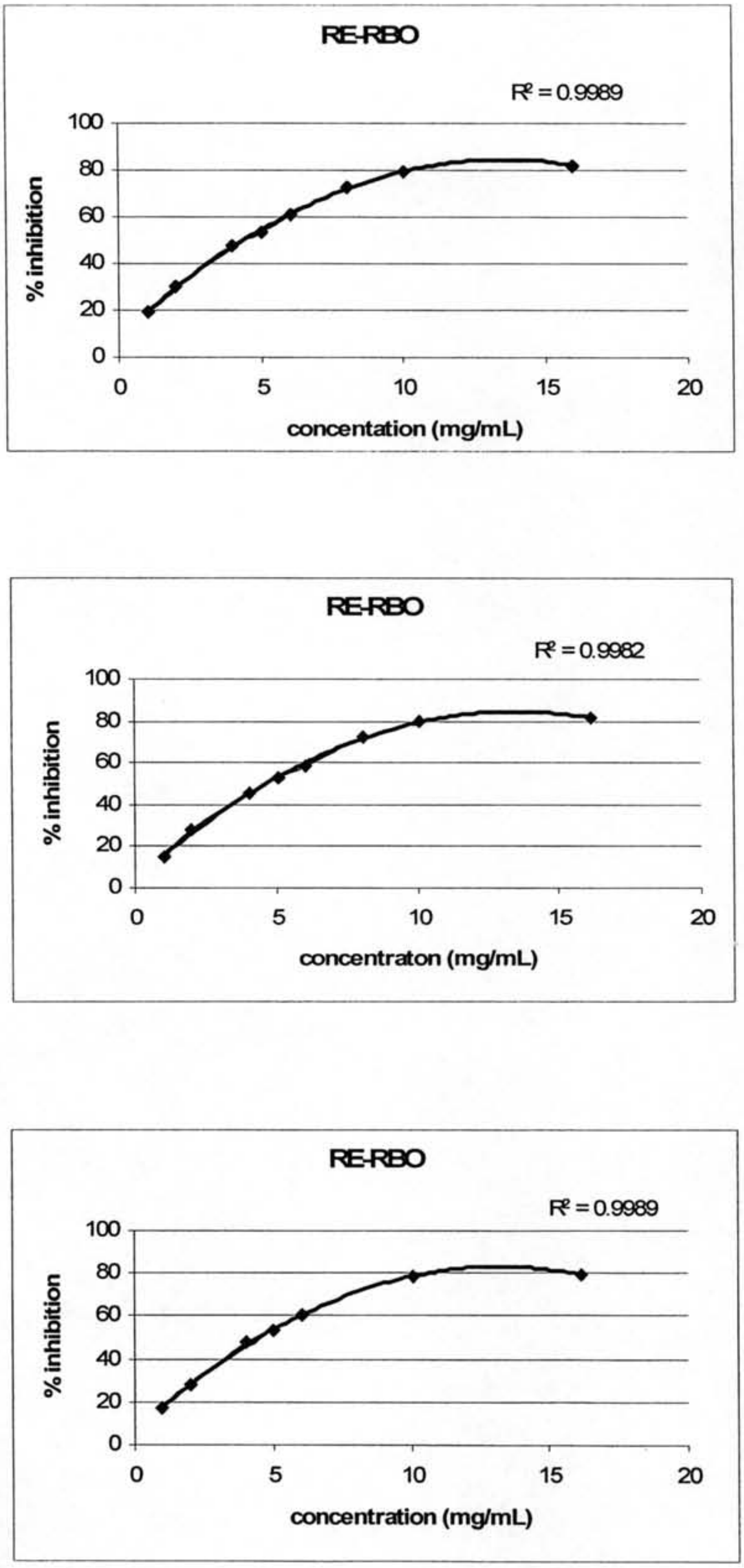
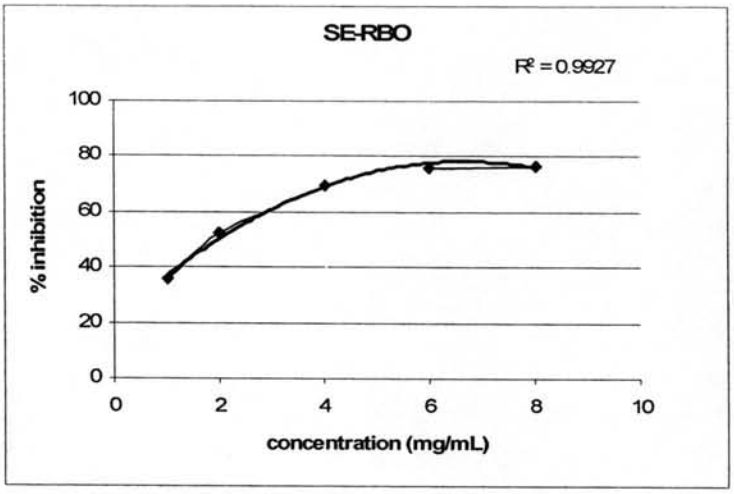
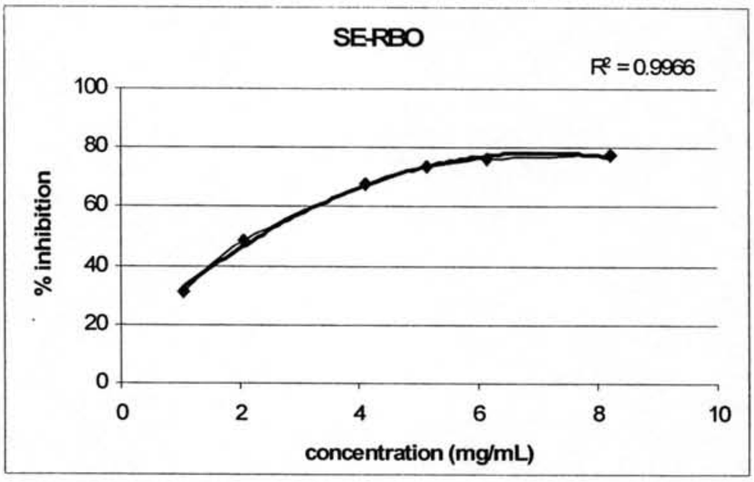


Figure 1A DPPH radical inhibition of RE-RBO





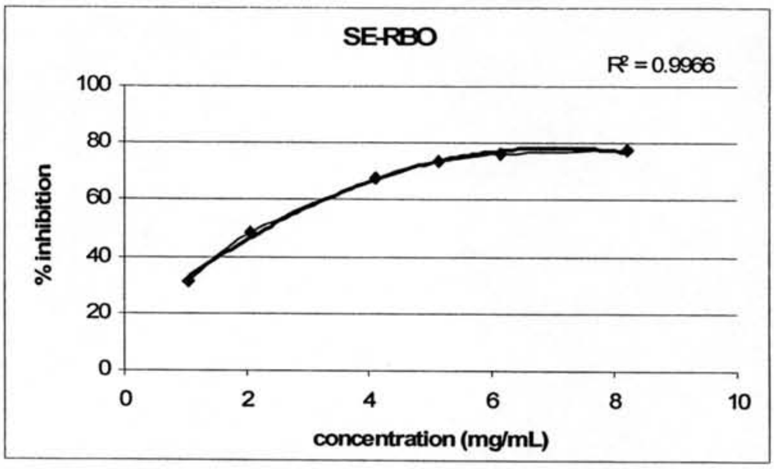
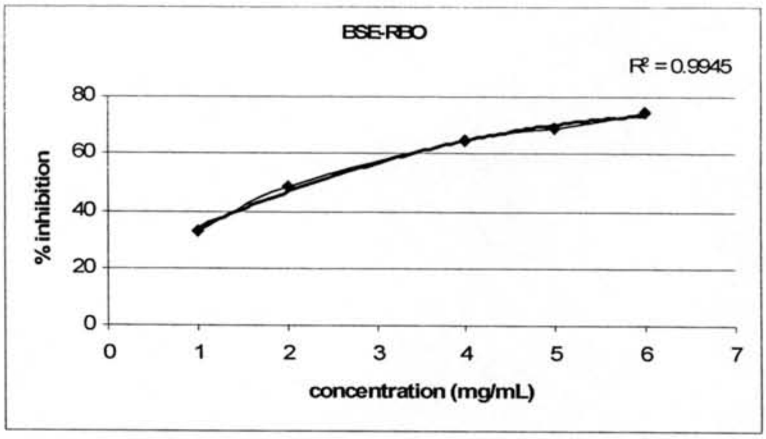
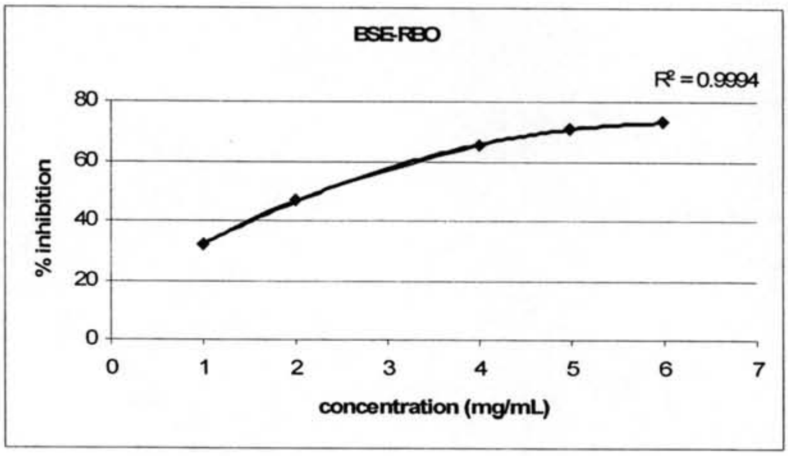


Figure 2A DPPH radical inhibition of SE-RBO





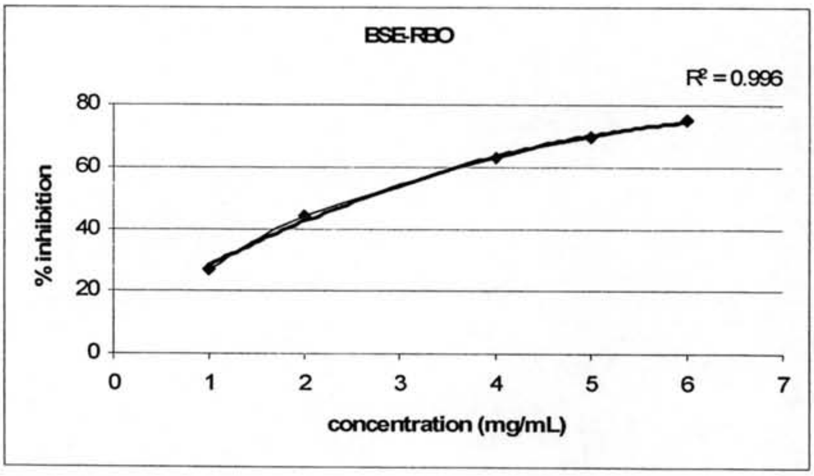
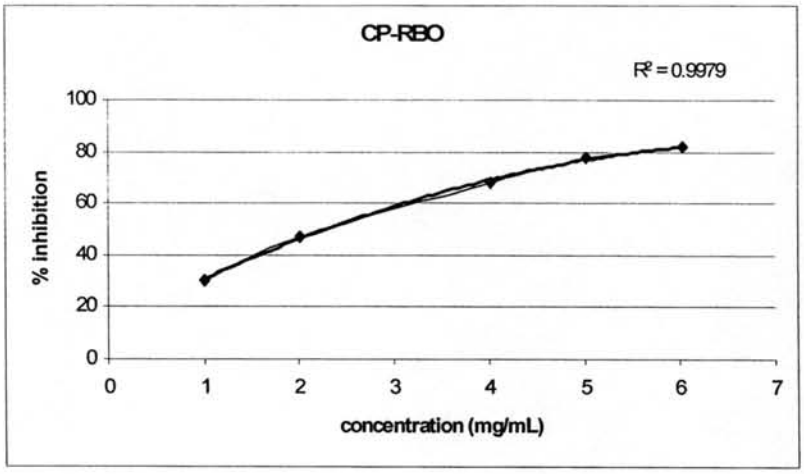
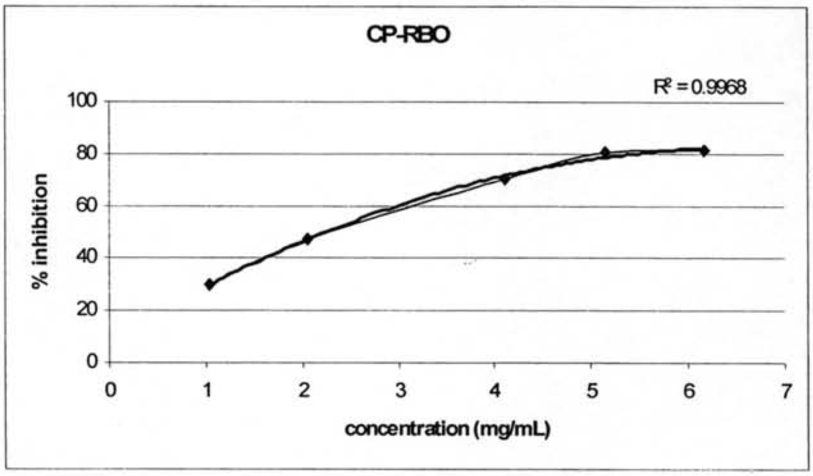


Figure 3A DPPH radical inhibition of BSE-RBO





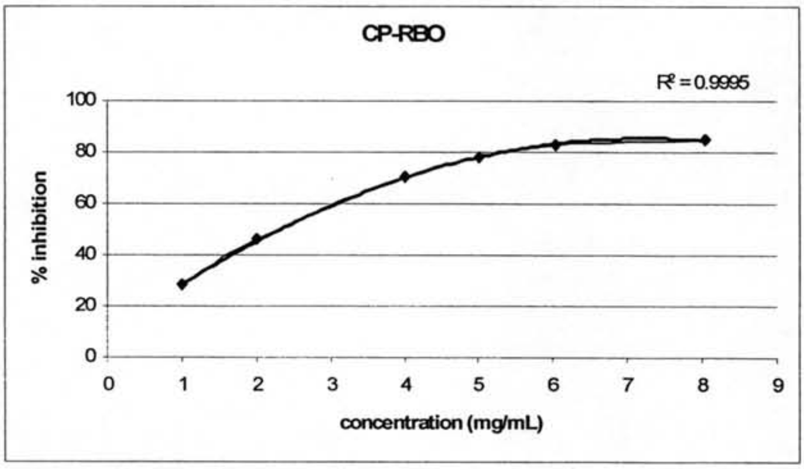


Figure 4A DPPH radical inhibition of CP-RBO

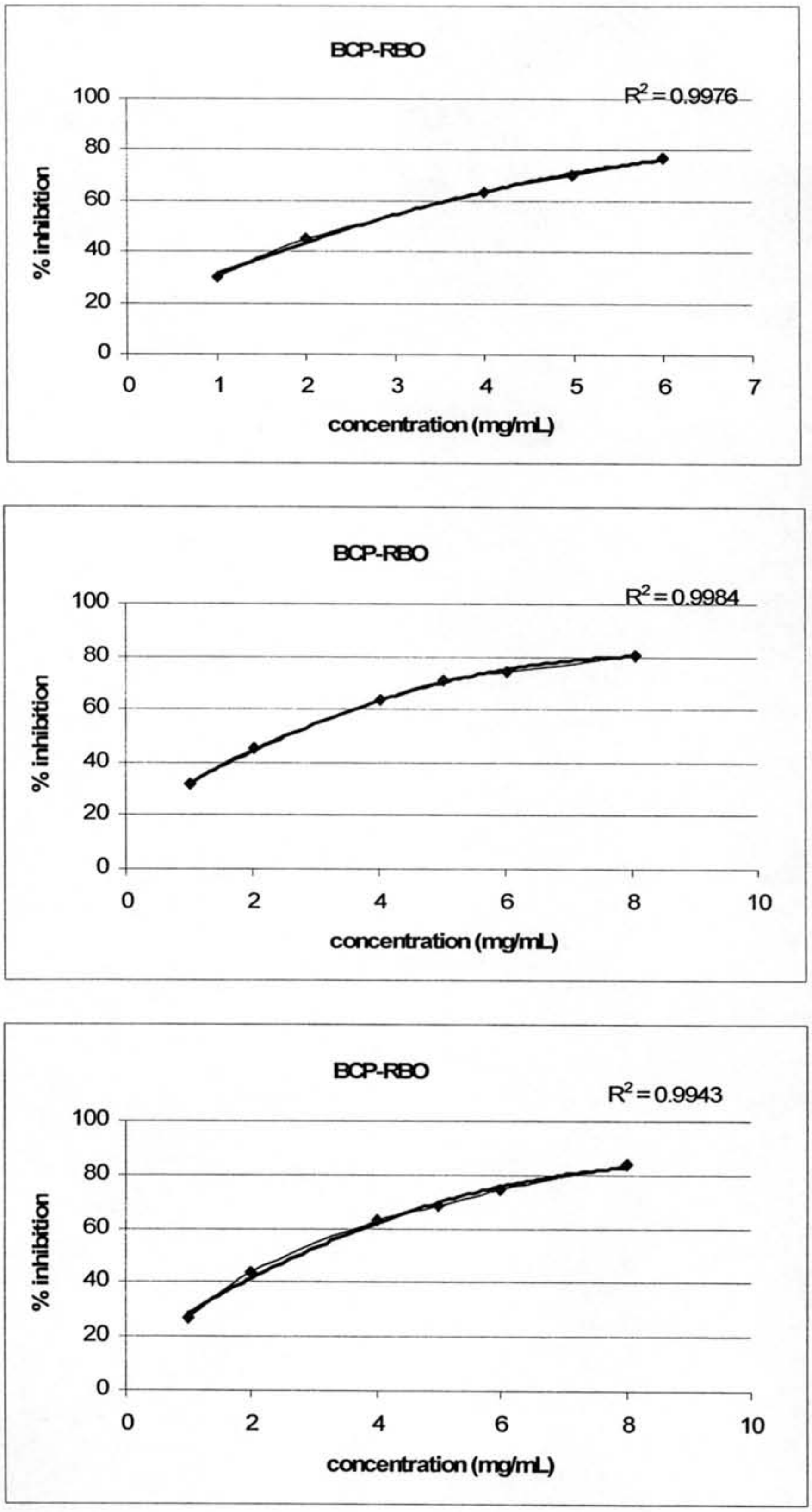


Figure 5A DPPH radical inhibition of BCP-RBO

APPENDIX B

Rate LAW and Arrhenius Equation

Zero Order Reaction

A reaction is of zero order when the rate of reaction is independent of the concentration of materials. The rate of reaction is a constant. When the limiting reactant is completely consumed, the reaction stops abruptly.

The zero order rate law for the general reaction

$A \longrightarrow P$

is written as the equation

$$\frac{-d[A]}{dt} = k \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

which on integration of both sides gives

$$[A] = -kt + C \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

When t = 0 the concentration of A is $[A]_0$. The constant of integration must be $[A]_0$

Now the integrated form of zero-order kinetics can be written as follows

$$[A] = -kt + [A]_0 \ldots\ldots\ldots\ldots\ldots (3)$$

Plotting [A] versus t will give a straight line with slope -k.

First Order Reaction

A general unimolecular reaction

$$A \longrightarrow P$$

where A is a reactant and P is a product is called a first-order reaction

The rate is proportional to the concentration of a single reactant raised to the first power.

The decrease in the concentration of A over time can be written as:

$$V = \frac{-d[A]}{dt} = k[A] \qquad (4)$$

$$\frac{-d[A]}{[A]} = kdt \qquad (5)$$

Equation (5) represents the differential form of the rate law. Integration of this equation and determination of the integration constant C produces the corresponding integrated law.

Integrating equation (5) yields:

$$\ln[A] = -kt + C \qquad (6)$$

The constant of integration C can be evaluated by using boundary conditions. When t = 0, $[A] = [A]_0$. $[A]_0$ is the original concentration of A.

Substituting into equation (6) gives:

$$\ln[A]_0 = -k(0) + C \qquad (7)$$

Therefore the value of the constant of integration is:

$$C = \ln[A]_0 \qquad (8)$$

Substituting (8) into (9) leads to:

$$\ln\frac{[A]_0}{[A]} = -kt \quad \text{.....................................(9)}$$

Plotting ln[A] or $\ln[A] / [A]_0$ against time creates a straight line with slope -k.

Second Order Reaction

The rate of a second order reaction is proportional to either the concentration of a reactant squared, or the product of concentrations of two reactants.
For the general case of a reaction between A and B, such that

$$A + B \longrightarrow P$$

the rate of reaction will be given by

$$V = \frac{-d[A]}{Dt} = k[A][B] \quad \text{........................(10)}$$

Initial concentrations of the two reactants are equal:
Equation (10) can be written as:

$$\frac{-d[A]}{dt} = k[A]^2 \quad \text{........................ .. (11)}$$

Separating the variables and integrating gives:

$$\frac{1}{[A]} = kt + C \quad \text{.............................(12)}$$

Provided that $[A] = [A]_0$ at $t = 0$ the constant of integration C becomes equal to $1/[A]_0$.

Thus the second order integrated rate equation is

$$\frac{1}{[A]} - \frac{1}{[A]_0} = kt \text{.....................(13)}$$

A plot of $1/[A]$ vs t produces a straight line with slope k and intercept $1/[A]_0$.

Arrhenius Equation

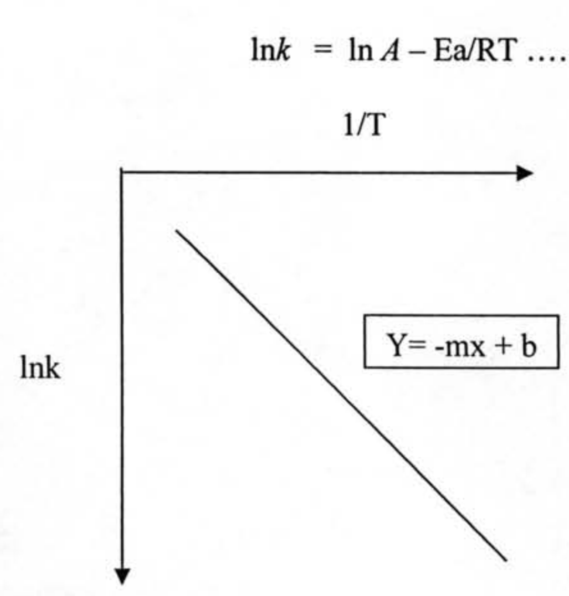
It is a well-known fact that raising the temperature increases the reaction rate. Quantitatively this relationship between the rate a reaction process and its temperature is determined by the Arrhenius Equation:

$$k = Ae^{-Ea/RT} \text{.......................(14)}$$

Where k is the reaction rate constant of any order, R denotes the gas constant (1.987 calories $degree^{-1}$ $mole^{-1}$), A is the frequency factor, Ea is the activation energy and T is the absolute temperature.

The Arrhenius equation is often written in the logarithmic form:

$$\ln k = \ln A - Ea/RT \text{.....................(15)}$$



A plot of lnk versus 1/T produces a straight line with the familiar form y = -mx + b, where

X =1/T

Y = lnk

$m = -E_a/R$

b = lnA

The activation energy E_a can be determined from the slope m of this line:

$E_a = -m*R$

The value of the activation energy E_a is rounded to one decimal place. The value of lnA shall be expressed with an accuracy of two decimal places. An accurate determination of the activation energy requires at least three runs completed at different reaction temperatures. The temperature intervals should be at least 5°C.

APPENDIX C

Chemical Information

Dow Corning® RM 2051
Thickening Agent

Thickening and emulsifying polymer in dimethicone

INCI NAME : Sodium Polyacrylate (and) Dimethicone (and) Cyclopentasiloxane (and) Trideceth-6 (and) PEG/PPG-18/18 Dimethicone

APPLICATIONS

Can be used in a wide range of personal care applications such as: skin care, sun care, color cosmetics, rinse-off and leave-on hair conditioners, hair styling products.

TYPICAL PROPERTIES

Parameter	Unit	value
Appearance		viscous opaque liquid with a slight yellow color
Odor		Characteristic odor
Silicone content	%	~29
Sodium Polyacrylate	%	~26
Viscosity at 25 °C/77°F (Brookfield LVT, 30rpm)	cPs	<4000
Flash point	°C	>100
Cyclotetrasiloxane (D4) content	%	<1

DESCRIPTION

DOW CORNING RM 2051

Thickening Agent is an inverse (w/o) emulsion of sodium polyacrylate in dimethicone (DOW CORNING 200 fluid 5cSt). The emulsion also contains two surfactant, a silicone emulsifier to stabilize the RM 2051. Thickening agent and an inverting agent (Trideceth-6) that helps to bring the polymer into contact with the aqueous phase of the formulation. When the product is added to water, the polymer expands instantly into the water phase to thicken and give stability to the preparation. As the formulation thickens, the oil phase ingredients are emulsified and stabilized.

HOW TO USE

Thickening Agent should be mixed before use. Oil-in-Water (o/w) emulsions can be prepared by adding RM2051 to the oil phase and then mixing with the water phase. The oil phase with RM2051 can be added to the water phase, or water phase can be added to oil phase. If the water phase is added to the oil phase the emulsions will invert as the water phase is added and this can reduce the particle size of the final emulsion. Alternatively, RM 2051 can be added after the oil phase and water phase have been mixed together. Regardless of which technique that is used, the mixer speed will need to be increased as the formulation thickens to maintain good mixing.

The effective pH range of pH 5.5-11 allows the use of DOW CORNING RM 2051 thickening Agent in a variety of personal care formulations. The recommended addition level is 3 to 6 %. RM 2051 can emulsified and stabilize all oil phase (up to 50%). It can be used with high solvent content (30 % ethanol, isopropyl alcohol or acetone, 50% glycerin or propylene glycol). The thickening agent efficiency will be reduced in the presence of electrolytes.

APPENDIX D
Questionnaires

แบบสอบถามประเมินความพึงพอใจของผลิตภัณฑ์

ชื่อ..นามสกุล..อายุ.....................................

กรุณาทำเครื่องหมาย ☐ ในช่องที่เห็นว่าเหมาะสมที่สุด

ผลิตภัณฑ์หมายเลข 1

ความพึงพอใจ	พอใจมากที่สุด	พอใจมาก	พอใจปานกลาง	พอใจน้อย	พอใจน้อยที่สุด
1. สี					
2.กลิ่น					
3.ความนุ่มนวล					
4.ความเนียนของเนื้อครีม					
5.การกระจายตัวและการดูดซึมบนผิว					

ข้อเสนอแนะ____

ผลิตภัณฑ์หมายเลข 2

ความพึงพอใจ	พอใจมากที่สุด	พอใจมาก	พอใจปานกลาง	พอใจน้อย	พอใจน้อยที่สุด
1. สี					
2.กลิ่น					
3.ความนุ่มนวล					
4.ความเนียนของเนื้อครีม					
5.การกระจายตัวและการดูดซึมบนผิว					

ข้อเสนอแนะ____

ผลิตภัณฑ์หมายเลข 3

ความพึงพอใจ	พอใจมากที่สุด	พอใจมาก	พอใจปานกลาง	พอใจน้อย	พอใจน้อยที่สุด
1. สี					
2.กลิ่น					
3.ความนุ่มนวล					
4.ความเนียนของเนื้อครีม					
5.การกระจายตัวและการดูดซึมบนผิว					

ข้อเสนอแนะ____

ผลิตภัณฑ์หมายเลข 4

ความพึงพอใจ	พอใจมากที่สุด	พอใจมาก	พอใจปานกลาง	พอใจน้อย	พอใจน้อยที่สุด
1. สี					
2.กลิ่น					
3.ความนุ่มนวล					
4.ความเนียนของเนื้อครีม					
5.การกระจายตัวและการดูดซึมบนผิว					

ข้อเสนอแนะ____

ผลิตภัณฑ์หมายเลข 5

ความพึงพอใจ	พอใจมากที่สุด	พอใจมาก	พอใจปานกลาง	พอใจน้อย	พอใจน้อยที่สุด
1. สี					
2.กลิ่น					
3.ความนุ่มนวล					
4.ความเนียนของเนื้อครีม					
5.การกระจายตัวและการดูดซึมบนผิว					

ข้อเสนอแนะ____

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APPENDIX E

Study Protocol Approval

No. 106/ 2551

Study Protocol Approval

The Ethics Committee of The Faculty of Pharmaceutical Sciences, Chulalongkorn University, Bangkok, Thailand has approved the following study to be carried out according to the protocol dated and/ or amended as follows:

Study Title:	**Formulation of O/W emulsions containing rice bran oil from various production methods and evaluation of free radical scavenging activity**
Study Code:	-
Centre:	CHULALONGKORN UNIVERSITY
Principal Investigator :	Mr. Rattanachot Mongkollikit
Protocol Date :	**January 21, 2008**

A list of the Ethics Committee members and positions present at the Ethics Committee meeting on the date of approval of this study has been attached.

This Study Protocol Approval Form will be forwarded to the Principal Investigator.

Chairman of Ethics Committee: ....

(Rungpetch Sakulbumrungsil, Ph.D.)

Secretary of Ethics Committee: Suyanee Pongthananikorn ....

(Suyanee Pongthananikorn, Ph.D.)

Date of Approval: **March 18, 2008**

VITA

Mr. Rattanachot Mogkollikit was born on January 6, 1979 in Chonburi, Thailand. He received his Bachelor's degree in Pharmacy from the Faculty of Pharmaceutical Sciences, Chulalongkorn University with a major in Manufacturing Technology in 2002. Before entering Master's degree program in Pharmacy at Chulalongkorn University, he worked as a production pharmacist in the Department of Parenteral Products at Saovabha Memorial Institute, Thai Red Cross Society, Thailand for three years.