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APPENDICES

APPENDIX A
METHODS OF ANALYSIS

Moisture Content

Regulate oven temperature to 105 ± 2 °C. Using low, cloztered alumimium dishes, weigh about 2 gm sample into each dish and shake until contents are evenly distributed. With covers removed, place dishes and covers on dishes and transfer to desiccator to cool. Weigh, and calculate loss in wt. as water.

Oil Content

Extract about 2 gm sample with anhydrous ether. Use thimble with porosity permitting rapid passage of ether. Extraction period may vary from 4 hours at condensation rate of 5-6 drops/sec to 16 hours at 2-3 drops/sec. Dry extract 30 minutes at 100°C under pressure 20 mm Hg cool and weigh.

Free Fatty Acid

Weigh crude oil 7.05 gm well mixed oil into 250 ml flask. Add 50 ml alcohol, previously neutralized by adding 2 ml phenolphthalein solution and enough 0.1N NaOH to produce faint pink appears and persist ≥ 1 minute. Report as % free fatty acids expressed as oleic acid; ml 0.25N NaOH used in titration correspinds to this %.

APPENDIX B

NOMENCLATURE

- A = Bed cross-section area, m^2
 A_s = Total surface area of solid particles, m^2
 a = Solid surface area per unit volume of bed, m^2/m^3
 Bi = Constant parameter, $h_p Re_p / k_s$
 C_f = Specific heat of fluid, $J/kg^\circ C$
 C_p = Specific heat of particle, $J/kg^\circ C$
 d = Diameter of spherical solid particle, m
 FFA = Free fatty acid, mg/g
 G = Mass flowrate of gas, kg/m^2
 Ga = Galileo number
 g = Acceleration due to gravity, m/sec^2
 H = Height of bed, m
 H_a = Height of bed active section, m
 h_p = Heat transfer coefficient between solid particle and fluid, $W/m^2^\circ C$
 K = Hydrolysis constant
 k = Thermal conductivity, $W/m^\circ C$
 l = Height of bed, m
 M_p = Mass of particle in the element, kg
 Nu_p = Nusselt's number for heat transfer between solid particle and fluid, $h_p g d_p / k$
 Pr = Gas Prandtl number, $C_p \mu / k$
 Re_p = Reynolds number, $d_p \rho U / \mu$
 r^2 = Coefficient of determination
 t = Storage time, days

- U = Superficial fluid velocity, m/sec
- ρ_f = Fluid density, kg/m³
- ρ_p = Particle density, kg/m³
- ϵ = Bed voidage fraction
- θ = Temperature of solid particles, °C
- μ = Fluid viscosity, N.sec/m²

AUTOBIOGRAPHY

MR. VARASAK LERTTRILUCK was born on March 3, 1956 in Bangkok, Thailand. He received his bachelor's Degree in Chemical Engineering from the faculty of Engineering, Chulalongkorn University in April 1978.

