41.1.21 - Oils and Fats

AOAC Official Method 940.28
Fatty Acids (Free)
in Crude and Refined Oils

Titration Method
First Action 1940
Final Action

National Cottonseed Products Association-AOAC Method

(**a**) *In crude oils.*—Weigh 7.05 g well-mixed oil into 250 mL flask or 4 oz bottle. Add 50 mL alcohol, previously neutralized by adding 2 mL phenolphthalein solution and enough 0.1M NaOH to produce faint permanent pink. Titrate with 0.25M NaOH, **936.16** (*see* A.1.12), with vigorous shaking until permanent faint pink appears and persists 1 min. Report as percent free fatty acids expressed as oleic acid; mL 0.25M NaOH used in titration corresponds to this percent.

(**b**) *In refined oils.*—To ca 50 mL alcohol in clean, dry 150 mL flask, add few drops of the oil and 2 mL phenolphthalein. Place flask in H_2O at 60-65°C until warm, and add enough 0.1M NaOH to produce faint permanent pink. Weigh 56.4 g oil into the neutralized alcohol and titrate with 0.1M NaOH, **936.16** (*see* Appendix A), occasionally warming and vigorously shaking mixture until same faint permanent pink appears in supernate alcohol. Multiply mL 0.1M NaOH by 0.05 and report as percent free fatty acids expressed as oleic acid.

Free fatty acids may also be expressed in terms of acid value (mg KOH necessary to neutralize 1 g oil).

Acid value = percent free fatty acids (as oleic) x 1.99