

Acetyltriethyl Citrate

1 Nonproprietary Names

USP–NF: Acetyltriethyl Citrate

2 Synonyms

ATEC; *Citroflex A-2*; *Citrofol All*; triethyl acetylcitrate; triethyl O-acetylcitrate; triethyl citrate acetate.

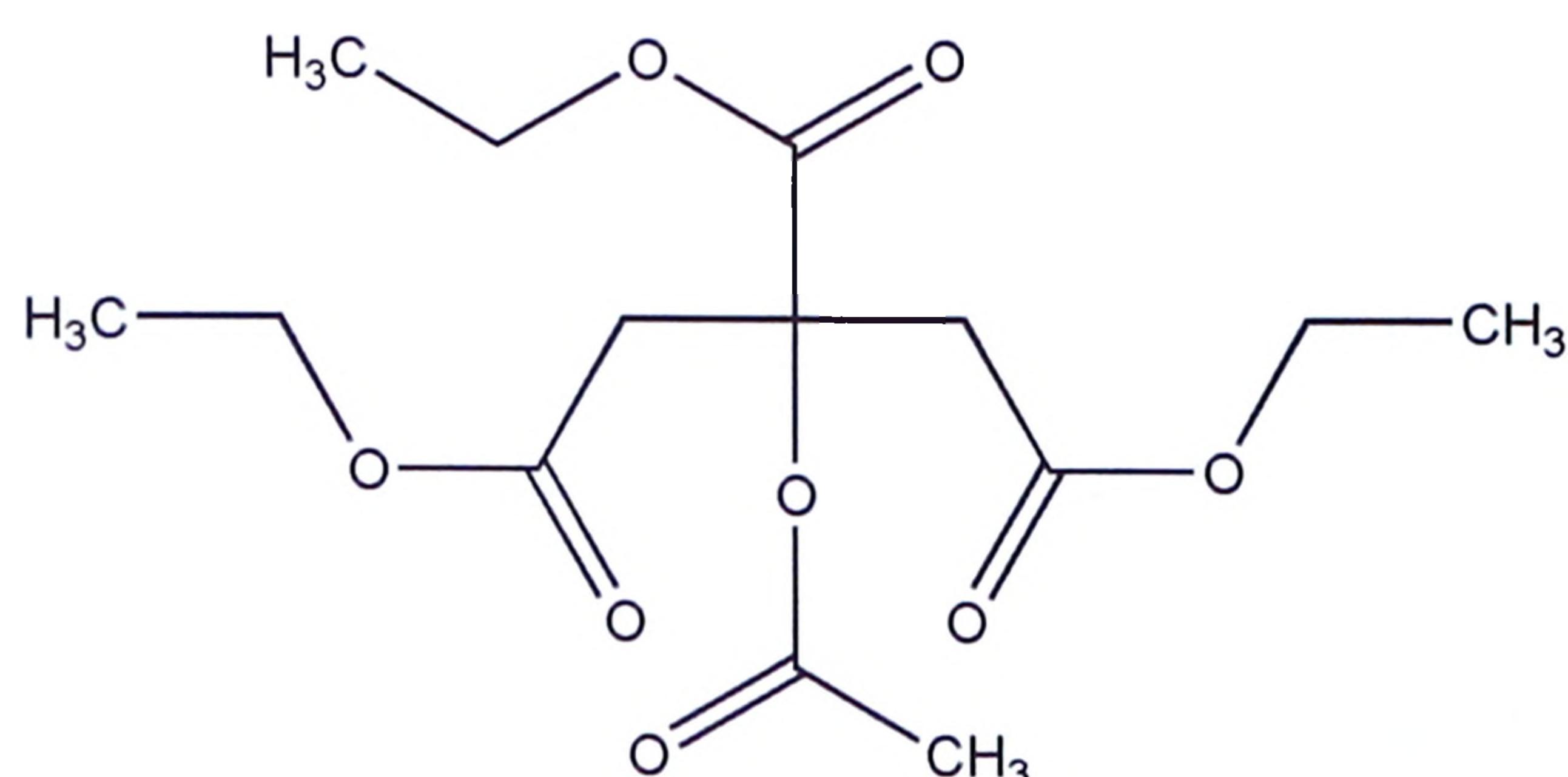
3 Chemical Name and CAS Registry Number

1,2,3-Propanetricarboxylic acid, 2-acetyloxy, triethyl ester [77-89-4]

4 Empirical Formula and Molecular Weight

$C_{14}H_{22}O_8$ 318.3

5 Structural Formula



6 Functional Category

Plasticizing agent.

7 Applications in Pharmaceutical Formulation or Technology

Acetyltriethyl citrate is used to plasticize polymers in formulated pharmaceutical coatings.⁽¹⁾ The coating applications include capsules, tablets, beads and granules for taste masking, immediate release, sustained-release and enteric formulations.^(2–5) It is also used in diffusion-controlled drug delivery systems.⁽⁶⁾

8 Description

Acetyltriethyl citrate occurs as a clear, odorless, practically colorless oily liquid.

9 Pharmacopeial Specifications

See Table I.

Table I: Pharmacopeial specifications for acetyltriethyl citrate.

Test	USP 40–NF 35 S1
Identification	+
Specific gravity	1.135–1.139
Refractive index	1.432–1.441
Acidity	+
Water	≤0.3%
Heavy metals	≤0.001%
Assay (anhydrous basis)	≥99.0%

10 Typical Properties

Acid value 0.02

Boiling point 294°C (decomposes); also 197°C at 15 mmHg⁽⁷⁾

Flash point 188°C

Pour point –43°C

Solubility Soluble 1 in 140 of water; miscible with acetone, ethanol, and propan-2-ol.

Spectroscopy

IR spectrum *see* Figure 1.

Raman spectrum *see* Figure 2.

Vapor density 11.1 (air = 1) for *Citroflex A-2*

Viscosity (dynamic) 54 mPa s (54 cP) at 25°C.

11 Stability and Storage Conditions

Acetyltriethyl citrate should be stored in dry, closed containers at temperatures not exceeding 38°C. When stored in accordance with these conditions, acetyltriethyl citrate is a stable product.

12 Incompatibilities

Acetyltriethyl citrate is incompatible with strong alkalis and oxidizing materials.

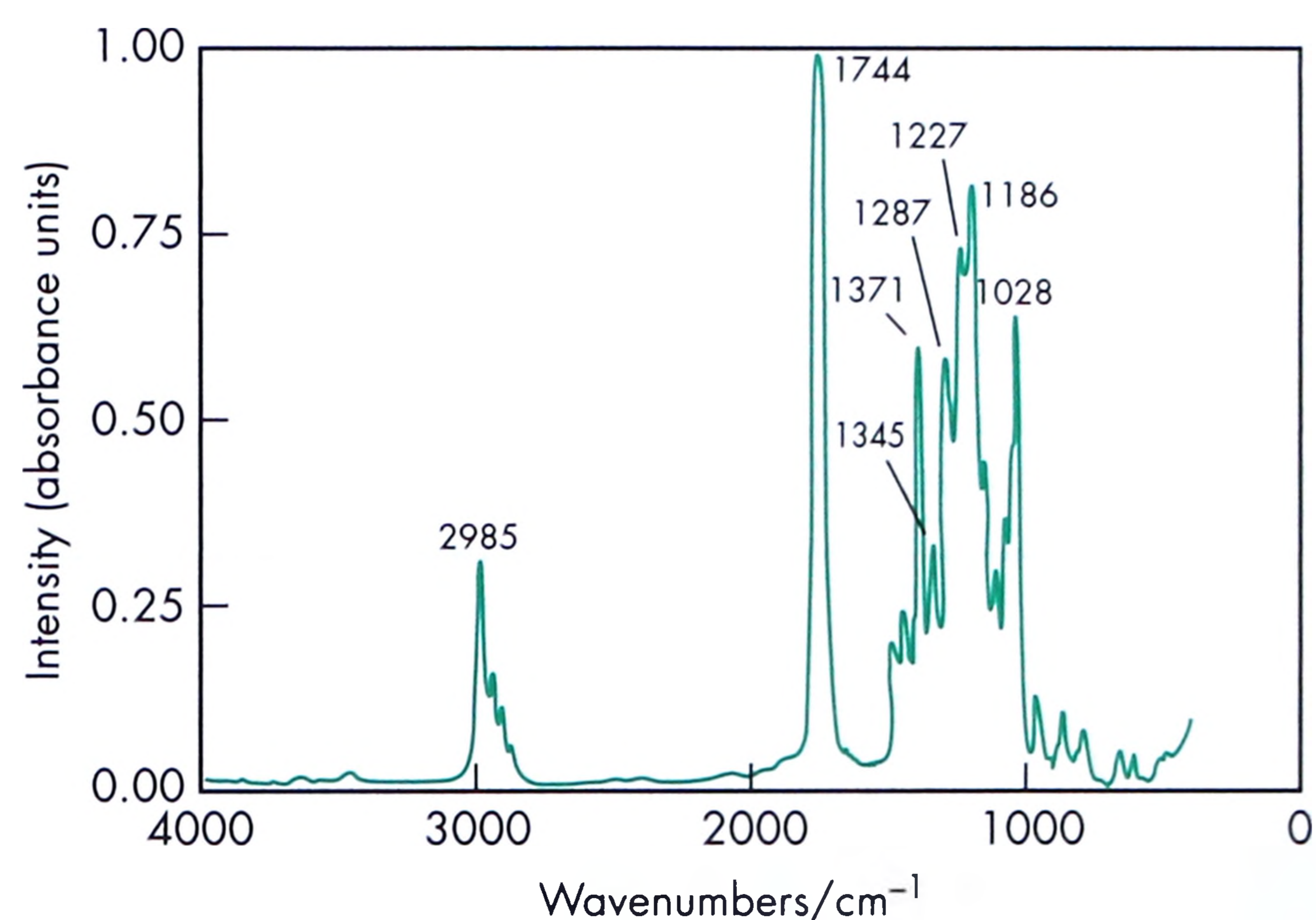


Figure 1: Infrared spectrum of acetyltriethyl citrate measured by transmission. Adapted with permission of Informa Healthcare.

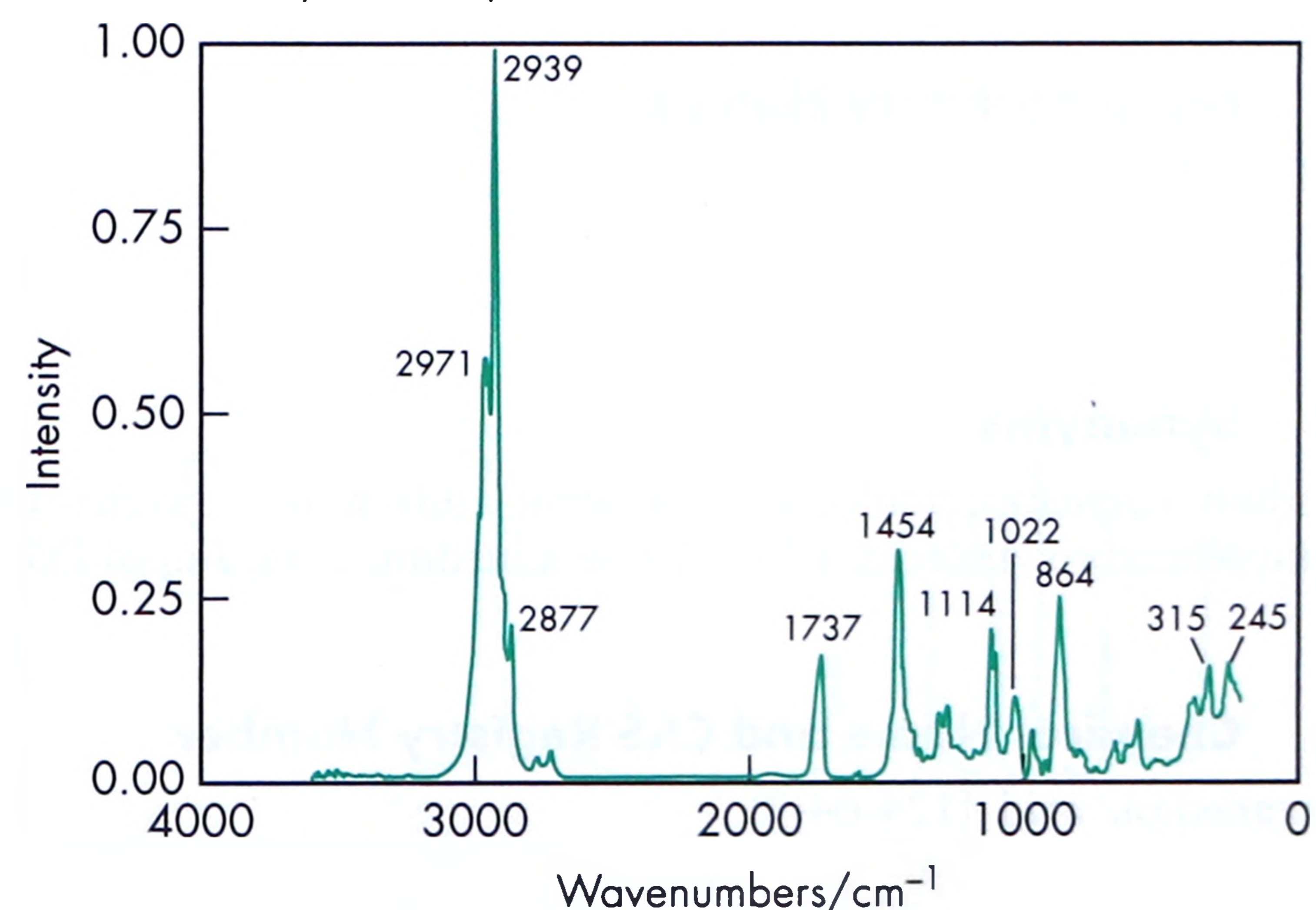


Figure 2: Raman spectrum of acetyltriethyl citrate measured in the 180° reflectance mode. Adapted with permission of Informa Healthcare.