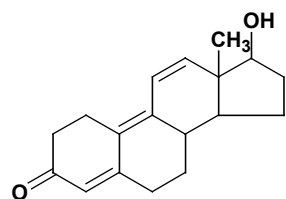


Analysis of hormone agents for veterinary medication using LC-MS

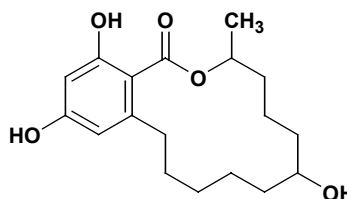
We consume fish and meat as part of our normal daily diets and healthy human life would be impossible without nutrition from such foodstuffs. Consequently not only a stable production and supply but safety of farm products, meat, and fish are demanded. Many agricultural chemicals and veterinary pharmaceuticals are currently used to increase productivity, but their residues in food are a problem. This report describes an analysis example of hormones used for livestock. Hormones are used to promote growth in livestock and their safety is investigated in the same way as

antibiotics and antiparasitics. The residual standards are established according to the level harmless to humans.

The structure of the hormones used in this analysis are shown in Fig. 1. Atmospheric-pressure chemical ionization (APCI) was used for the ionization in LC-MS. Figs. 2 and 3 show their mass chromatograms and mass spectra. α - and β -trenbolone exhibit a mass spectrum with the protonated molecule as the base peak, while zeranol was detected with the dehydrated ion of the protonated molecule as the base peak.



Trenbolone : C₁₈H₂₂O₂
Exact Mass: 270.16
Mol. Wt.: 270.37



Zeranol : C₁₈H₂₆O₅
Exact Mass: 322.18
Mol. Wt.: 322.40

Fig. 1 Structures of trenbolone and zeranol

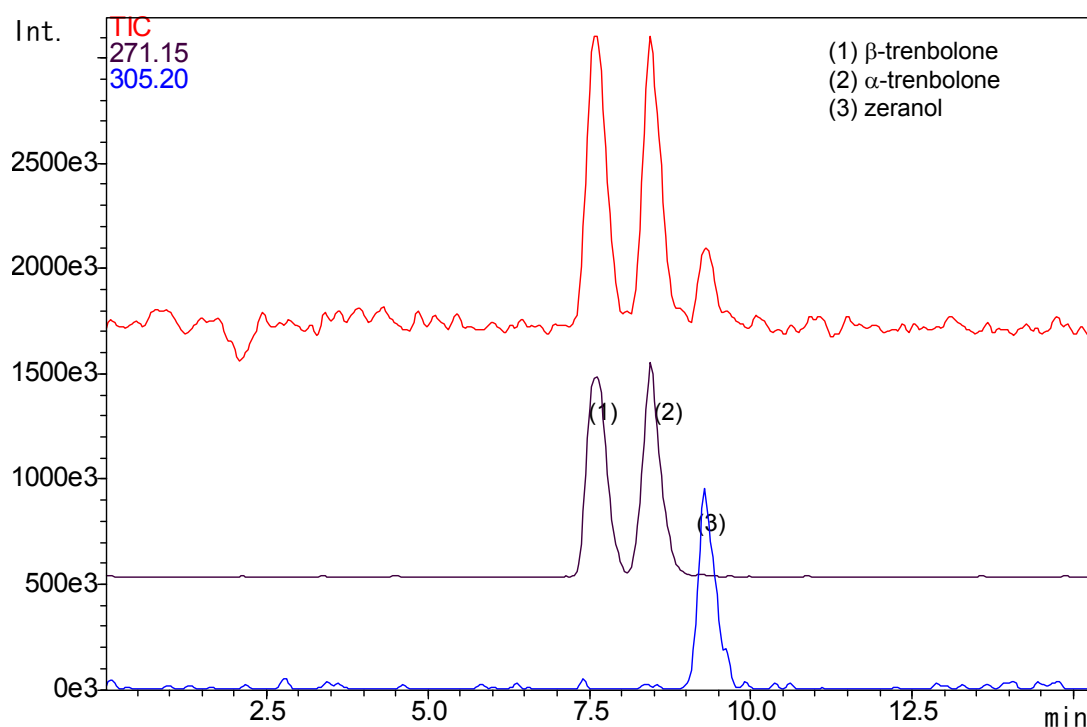
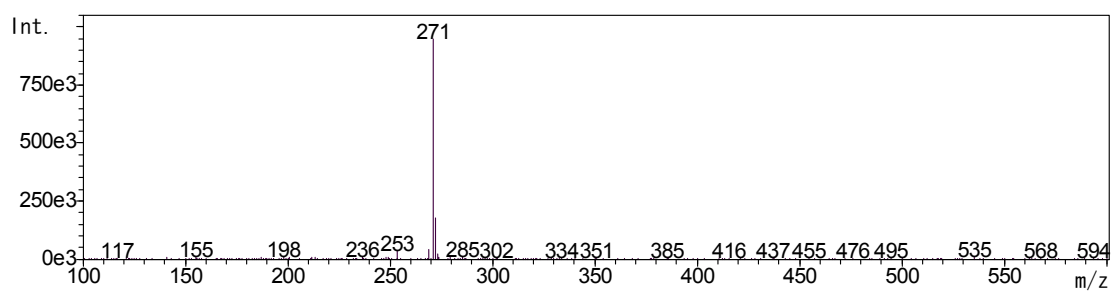
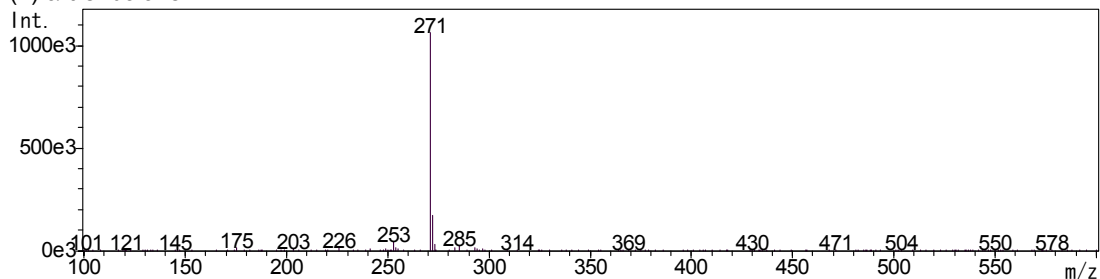


Fig. 2 Mass chromatograms of hormone agents

(1) β -trenbolone



(2) α -trenbolone



(3) zeranol

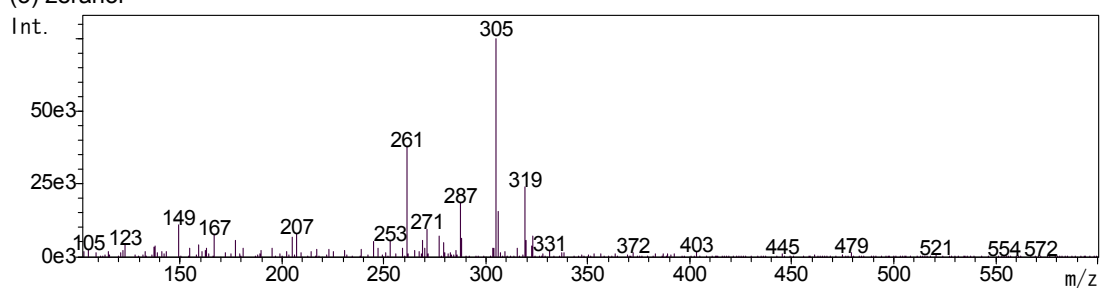


Fig. 3 Mass spectra of hormone agents

Table 1 Analytical conditions for LC-MS

Column	: STR ODS-II (2.0 mmI.D. x 150 mm)		
Mobile phase	: 60% methanol-water containing 0.3% acetic acid		
Flow rate	: 0.2 mL/min		
Column temperature	: 40 °C		
Probe voltage	: +4.5 kV (APCI-Positive mode)		
CDL temperature	: 230 °C	Probe temperature	: 400 °C
Nebulizing gas flow	: 2.5 L/min	DEFs voltage	: +47 V
CDL voltage	: -30 V		
Scan range	: m/z 100-600		

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