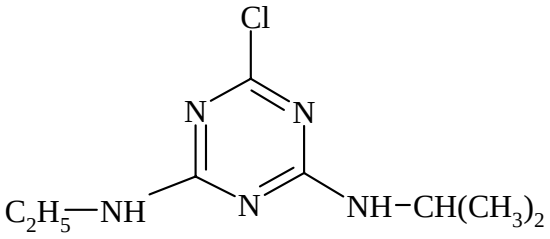
ATRAZINE
91



ISO common name	Atrazine
Chemical name	2-Chloro-4-ethylamino-6-isopropylamino-1,3,5-triazine (IUPAC); 6-chloro-*N*-ethyl-*N*'-(1-methylethyl)-1,3,5-triazine-2,4-diamine (CA; *1912-24-9*)
Empirical formula	$C_8H_{14}ClN_5$
RMM	215.7
m.p	175 - 177 °C
v.p.	4.0×10^{-6} Pa at 20 °C
Solubility	In water: 28 mg/l at 20 °C; methanol: 18 g/l; chloroform: 52 g/l
Description	Colourless crystals
Stability	Stable under neutral or weakly acid or weakly alkaline conditions; but hydrolyses under stronger acid or stronger alkaline conditions, and under neutral conditions at higher temperatures.
Formulations	Wettable powders, water dispersible granules and suspension concentrates

ATRAZINE TECHNICAL

*__91__/TC/M/-

1 Sampling. Take at least 100 g.

2 Identity tests

2.1 Infrared. Prepare potassium bromide discs from the sample and from atrazine standard. Scan the discs from 400 - 4000 cm^{-1}. The spectrum from the sample should not differ significantly from that of the standard.

2.2 GLC. Use the GLC method below. The relative retention time of atrazine with respect to the internal standard for the sample solution should not deviate by more than 1% from that for the calibration solution.

3 Atrazine

OUTLINE OF METHOD Atrazine is determined by gas chromatography on a Carbowax 20M column using flame ionisation detection and internal standardisation.

REAGENTS

Atrazine standard of known purity

Dieldrin internal standard. Should not contain any impurities that elute at the atrazine retention time.

Chloroform

Internal standard solution. Weigh into a volumetric flask (500 ml) 4.0 ± 0.02 g of dieldrin. Dissolve in, and fill to the mark with, chloroform.

Calibration solution. Weigh (to the nearest 0.1 mg) into a ground-glass stoppered round bottomed flask (100 ml) about 250 mg (*s* mg) atrazine standard. Add by pipette internal standard solution (50.0 ml), stopper, and shake mechanically for 30 min.

APPARATUS

Gas chromatograph fitted with a flame ionisation detector

Column glass, 1.8 m × 4 mm (i.d.) packed with 3% Carbowax 20M on 80 to 100 mesh Gas Chrom Q. Condition the column at 240 °C for 24 h using carrier gas at about 40 ml/min.

Electronic integrator or *data system*

Mechanical shaker

* AOAC-CIPAC method 1973.

PROCEDURE

(a) Operating conditions (typical):

Oven temperature	200 °C
Injection port temperature	240 °C
Detector temperature	240 °C
Injection volume	3 µl
Number of theoretical plates	At least 2000
Flow rate carrier gas	Nitrogen or helium, 80 to 100 ml/min
Flow rates other gases	As recommended for the particular detector
Retention times	atrazine: 5 to 7 min internal standard: 9 to 12 min

(b) Preparation of sample. Weigh (to the nearest 0.1 mg) into a ground-glass stoppered round bottomed flask (100 ml) sufficient sample to contain about 250 mg atrazine (*w* mg). Add by pipette internal standard solution (50.0 ml), stopper and shake mechanically for 30 min. Allow any insoluble material to settle, or centrifuge a portion of the solution to obtain a clear solution.

(c) Determination. Inject into the gas chromatograph 3 µl portions of the calibration solution until the peak height ratio of atrazine : dieldrin varies by less than 1 % for successive injections. Then make duplicate 3 µl injections of the sample solution followed by duplicate injections of the calibration solution. Peak height ratios must be within 1 % of the first accepted standard values or repeat the series of injections. Repeat for additional samples. Calculate the peak height ratios for both duplicate injections preceding and following the sample injections. Average the four values (*R′*). Calculate the average peak height ratios for the two sample injections (*R*).

(d) Calculation

$$\text{Atrazine content} = \frac{R \times s \times P}{R' \times w} \text{ g/kg}$$

where:

R = atrazine to dieldrin peak height ratio for the sample solution
R' = atrazine to dieldrin peak height ratio for the calibration solution
s = mass of atrazine in the calibration solution (mg)
w = mass of atrazine in the sample solution (mg)
P = purity of the atrazine standard (g/kg)

ATRAZINE WETTABLE POWDERS
*__91__/WP/M/-

1 Sampling. Take at least 500 g.

2 Identity tests

2.1 Infrared. Extract the sample with chloroform, filter and evaporate the solvent in a stream of clean, dry air. Continue as for **91**/TC/M/2.1.

2.3 GLC. As for atrazine technical **91**/TC/M/2.2.

3 Atrazine. As for atrazine technical for **91**/TC/M/3.

4 Suspensibilty

(a) Preparation of suspension. MT 15.1 *(i)*.

(b) Determination of sedimentation. MT 15.1 *(ii)*.

(c) Determination of atrazine in the bottom 25 ml of suspension. After removal of the top 225 ml transfer the bottom 25 ml of suspension to a large evaporating dish, remove the water by heating in an oven at 100 °C and determine the mass (*Q* g) of atrazine in the residue by **91**/TC/M/3.

(d) Calculation

$$\text{Suspensibility} = \frac{111\,(c - Q)}{c}\ \%$$

where:

c = mass of active ingredient in sample taken for the preparation of the suspension (g)

Q = mass of active ingredient in the 25 ml remaining in the cylinder (g)

ATRAZINE WATER DISPERSIBLE GRANULES
*__91__/WG/M/-

1 Sampling. Take at least 1 kg.

2 Identity tests

2.1 Infrared. Extract the sample with chloroform, filter and evaporate the solvent in a stream of clean, dry air. Continue as for **91**/TC/M/2.1.

2.2 GLC. As for atrazine technical **91**/TC/M/2.2.

* AOAC-CIPAC method 1973.

3 Atrazine. As for atrazine technical for **91**/TC/M/3.

4 Suspensibilty

(a) Preparation of suspension and determination of sedimentation. MT 168.

(b) Determination of atrazine in the bottom 25 ml of suspension. As for atrazine wettable powders **91**/WP/M/4*(c)*.

(c) Calculation. As for atrazine wettable powders **91**/WP/M/4*(d)*.