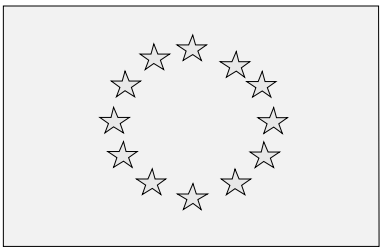
rivm

National Institute
for Public Health and
the Environment



Datasheet 4-Desoxycarbadox

Reference number : CEC/MAT : 22

Date of preparation : 1994.05.24

date : 1999.02.16

source : CSL

"Bank of Reference Standards"

The Bank of Reference Standards was financially supported by the European Commission

Directorate General "Science, Research and Development DG XII"

Contract MAT 1 - CT92 - 0020

Contract number	:	MAT-CT92-0020[388710]			
Reference number	:	CEC/MAT 22			
Last update	:	1998.01.06	Chemical purity	:	>95 %
Quantity	:	1.97 mg			

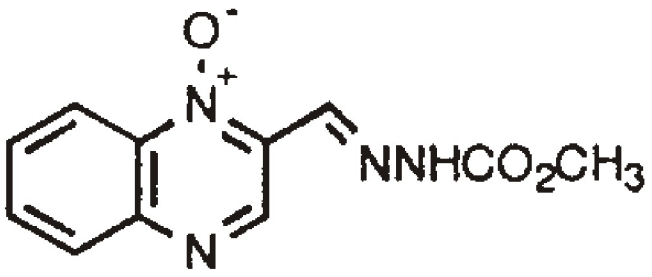


Figure 1. Molecular structure of 4-desoxycarbadox

Name : Methyl 3-(2-quinoxalinylmethylene)-carbazate N^1-oxide
Synonym : 4-Desoxycarbadox
Molecular formula : $C_{11}H_{10}N_4O_3$
Molecular weight : 246.226

Long term stability tested on 1997.11.11 : 111.0 ± 0.2 %
(storage 4 °C, analysis HPLC-UV, 6 tests on 2 ampoules)

Methods of Characterization:

I UV spectroscopy
II IR spectroscopy
III Mass spectroscopy
IV ^{1}H-NMR spectroscopy

I UV Spectroscopy

Instrument: Hitachi U 3000
Method: Dissolved in ethanol (20mg/l)

Results

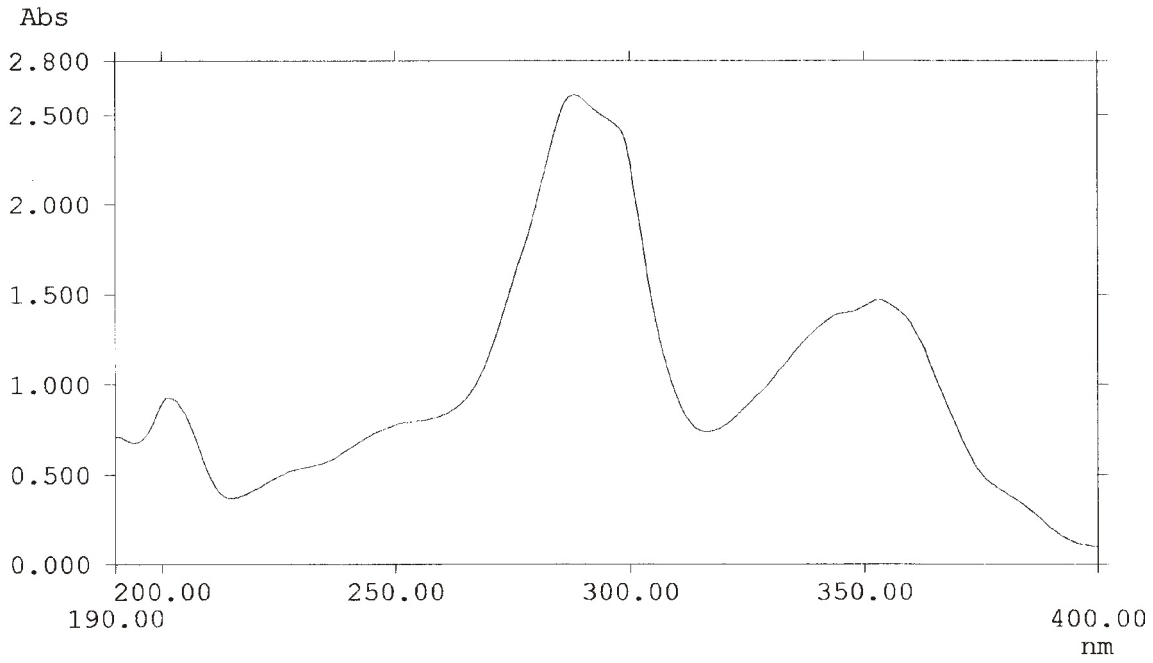


Figure 2. The UV spectrum of 4-desoxycarbadox

Peak no.	wavelength (nm)	absorbance
1	353.00	1.4693
2	288.00	2.6092
3	201.00	0.9279

II IR-Spectroscopy

Instrument: Perkin Elmer STIR 1720X
Sampling technique: nujol mull

Results

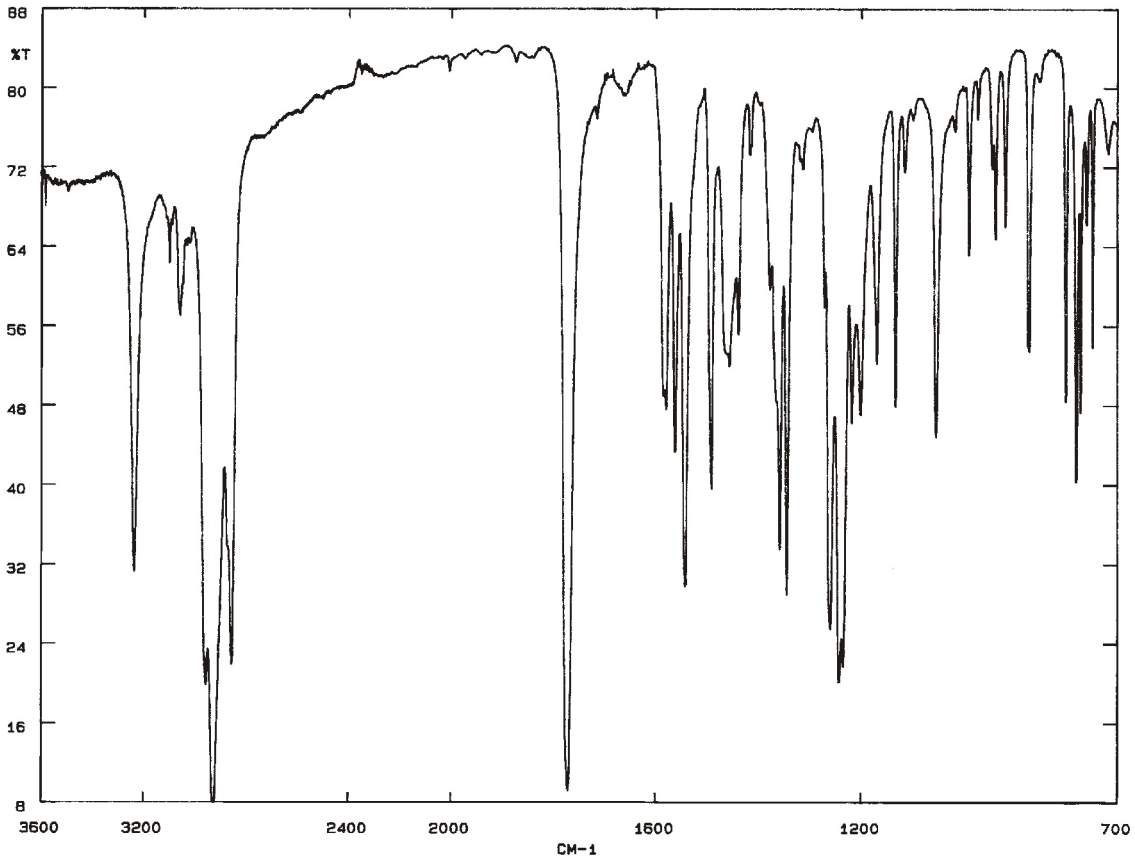


Figure 3. The IR-spectrum of 4-desoxycarbadox

Wavelength (cm-1)	designation
3234	N-H stretch
1771	C=O stretch
1562	C=C stretch in aromatic compounds
1542	
1491	C=C stretch in aromatic compounds
1358	
1344	
1259	
1242	
1218	C-O stretch
1201	
1053	
780	C-H out of plane deformations

III Mass spectroscopy

Instrument: Kratos MS 25
Method: Direct probe, 70 ev electron impact

Results

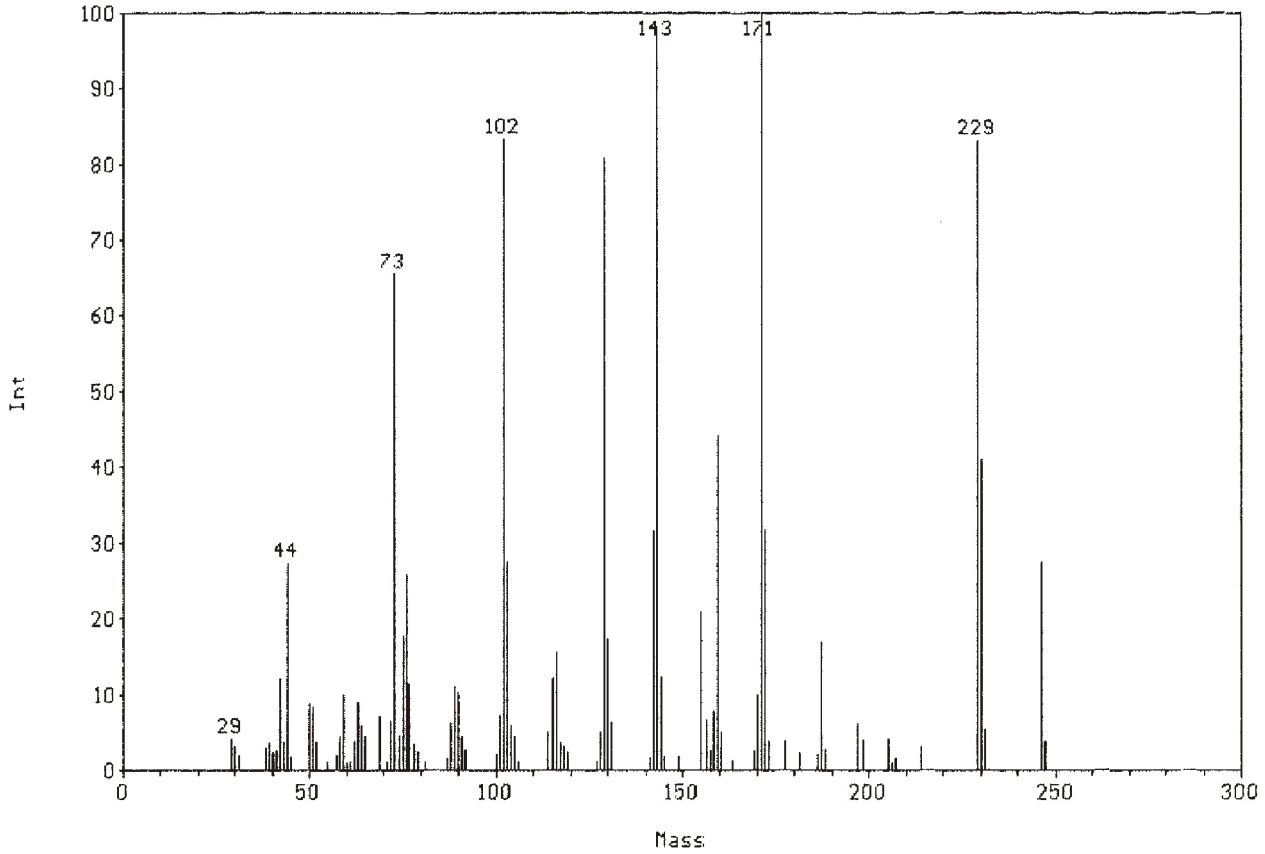


Figure 4. The mass spectrum of 4-desoxycarbadox

m/u	percentage	designation
246	27	M
230	41	M - O
214	3	M - CH_3OH
187	17	M - CH_3OCO
172	31	
171	100	M - (CH_3OCO + O)
159	44	
155	21	
143	98	M - ($NNCH_3OCO$ + O)
142	31	
130	17	
129	81	
103	27	
102	83	
76	26	
73	65	DMF
44	27	DMF - NCH_3

III ^{1}H-NMR Spectroscopy

Instrument: GX 400
Solvent: DMSO-d_6 and CD_3OD with TMS (δ = 0.0) as internal standard.

Results

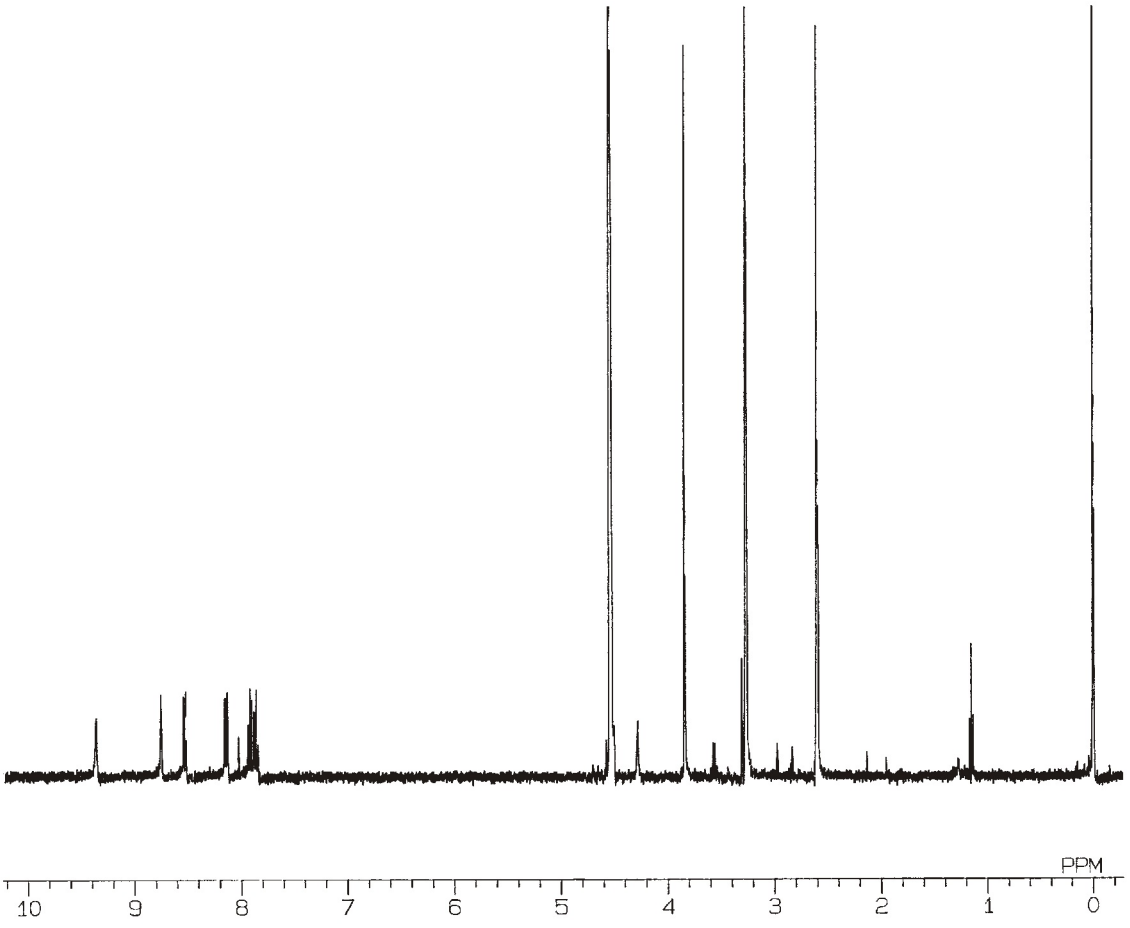


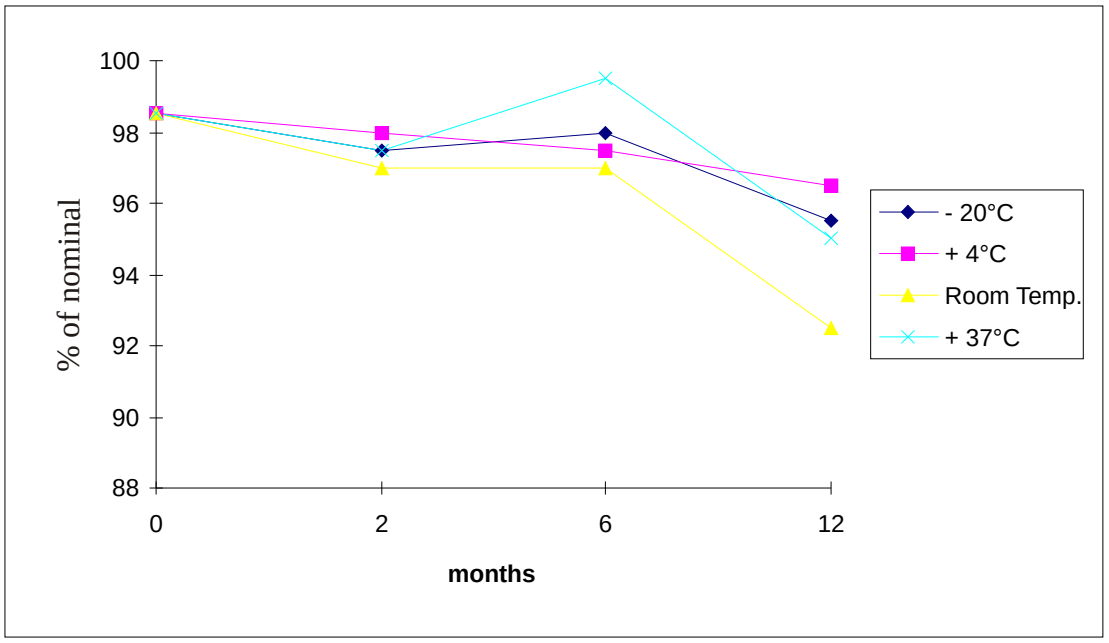
Figure 5. The NMR spectrum of 4-desoxycarbadox

Chemical Shift (δ)	number of protons	designation
3.84	3	CH_3
7.90	2	H6 and H7 (arom.)
8.14	1	H5 or H8 (arom.)
8.52	1	H5 or H8 (arom.)
8.75	1	H11
9.35	1	H3

Preparation and validation of reference standards.

The production of ampoules containing the reference material was described in the final report produced September 1995.
The thermal stability of the compound was under investigation and the results for 4-desoxycarbadox over a period of one year are expressed in the table and chart below.

4-Desoxycarbadox Stability Trials



Results of 4-desoxycarbadox stability trials

The results below are the % recovery (with cv) of 4-desoxycarbadox at 4 different storage temperatures over a period of 12 months compared with a standard equivalent to 2 mg.

	temp. (°C)	t = 0 months (% recovery)	t = 2 months (% recovery)	t = 6 months (% recovery)	t = 12 months (% recovery)
4-DSC	- 20°C	98.5 +/- 1.5	97.5 +/- 1.0	98.0 +/- 1.0	95.5 +/- 1.5
	4°C	-	98.0 +/- 2.0	97.5 +/- 2.0	96.5 +/- 2.0
	Room Temp.	-	97.0 +/- 2.0	97.0 +/- 2.5	92.5 +/- 0.5
	37°C	-	97.5 +/- 2.5	99.5 +/- 2.0	95.0 +/- 2.5

Conclusion

All the spectroscopic data is consistant with the proposed structure although a very small amount of DMF (which was used as solvent during ampouling) was detected by NMR and MS*.
No significant impurities were detected by any of the methods of characterization employed.

The results from the stability trials indicate that 4-desoxycarbadox is acceptably stable over a period of one year at temperatures up to 37 °C.

* At approximately 2.8 and 2.9 d in the NMR spectrum and 73 m/u in the mass spectrum.