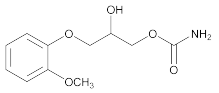
Methocarbamol



$C_{11}H_{15}NO_5$ 241.24
1,2-Propanediol, 3-(2-methoxyphenoxy)-, 1-carbamate, (±)-;
(±)-3-(*o*-Methoxyphenoxy)-1,2-propanediol 1-carbamate [532-03-6].

DEFINITION
Methocarbamol contains NLT 98.5% and NMT 101.5% of methocarbamol ($C_{11}H_{15}NO_5$), calculated on the dried basis.

IDENTIFICATION
- **A. Infrared Absorption** ⟨197K⟩
- **B.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.

ASSAY
- **Procedure**

Buffer: 6.8 g/L of monobasic potassium phosphate in water. Adjust with phosphoric acid or sodium hydroxide to a pH of 4.5.
Mobile phase: Methanol and *Buffer* (30:70)
System suitability solution: 1.0 mg/mL of USP Methocarbamol RS and 0.005 mg/mL of USP Guaifenesin RS in *Mobile phase*
Standard solution: 0.1 mg/mL of USP Methocarbamol RS in *Mobile phase*
Sample solution: 0.1 mg/mL of Methocarbamol in *Mobile phase*
Chromatographic system
(See *Chromatography* ⟨621⟩, *System Suitability*.)
Mode: LC
Detector: UV 274 nm
Column: 4.6-mm × 15-cm; 3-µm packing L1
Column temperature: 30°
Flow rate: 0.8 mL/min
Injection volume: 20 µL
Run time: 1.5 times the retention time of methocarbamol
System suitability
Samples: *System suitability solution* and *Standard solution*
[NOTE—See *Table 1* for relative retention times.]
Suitability requirements
Resolution: NLT 3.5 between methocarbamol and guaifenesin, *System suitability solution*
Tailing factor: NMT 2.0, *Standard solution*
Relative standard deviation: NMT 0.73%, *Standard solution*
Analysis
Samples: *Standard solution* and *Sample solution*
Calculate the percentage of methocarbamol ($C_{11}H_{15}NO_5$) in the portion of Methocarbamol taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times 100$$

r_U = peak response of methocarbamol from the *Sample solution*
r_S = peak response of methocarbamol from the *Standard solution*
C_S = concentration of USP Methocarbamol RS in the *Standard solution* (mg/mL)
C_U = concentration of Methocarbamol in the *Sample solution* (mg/mL)
Acceptance criteria: 98.5%–101.5% on the dried basis

IMPURITIES
- **Residue on Ignition** ⟨281⟩**:** NMT 0.1%

Delete the following:

•• **Heavy Metals** ⟨231⟩, *Method I*
Sample solution: 1.0 g in a 10-mL mixture of methanol and 1 N acetic acid (7:3), diluted with water to 25 mL
Acceptance criteria: NMT 20 ppm• (Official 1-Jan-2018)

Change to read:

- **Organic Impurities**

Mobile phase, System suitability solution, and **Chromatographic system:** Proceed as directed in the *Assay*.
Standard solution: 0.005 mg/mL of USP Methocarbamol RS in *Mobile phase*
Sample solution: 1 mg/mL of Methocarbamol in *Mobile phase*
System suitability
Samples: *System suitability solution* and *Standard solution*
[NOTE—See *Table 1* for the relative retention times.]
Suitability requirements
Resolution: NLT 3.5 between methocarbamol and guaifenesin, *System suitability solution*
Tailing factor: NMT 2.0, *Standard solution*
Relative standard deviation: NMT 5.0%, *Standard solution*
Analysis
Samples: *Standard solution* and *Sample solution*
Calculate the percentage of each impurity in the portion of Methocarbamol taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times (1/F) \times 100$$

r_U = peak response of each impurity from the *Sample solution*
r_S = peak response of methocarbamol from the *Standard solution*
C_S = concentration of USP Methocarbamol RS in the *Standard solution* (mg/mL)
C_U = concentration of Methocarbamol in the *Sample solution* (mg/mL)
F = relative response factor (see *Table 1*)
Acceptance criteria: See *Table 1*.

Table 1

Name	Relative Retention Time	Relative Response Factor	Acceptance Criteria, NMT (%)
Guaifenesin	0.84	1.2	•0.15• (IRA 1-Jan-2016)
Methocarbamol isomer[a]	0.90	1.0	•0.05• (IRA 1-Jan-2016)
Methocarbamol	1.0	—	•—• (IRA 1-Jan-2016)
Methocarbamol dioxolone[b]	1.3	1.0	•0.05• (IRA 1-Jan-2016)

[a] 1-Hydroxy-3-(2-methoxyphenoxy)propan-2-yl carbamate.
[b] 4-[(2-Methoxyphenoxy)methyl]-1,3-dioxolan-2-one.

Table 1 *(Continued)*

Name	Relative Retention Time	Relative Response Factor	Acceptance Criteria, NMT (%)
Any individual unspecified impurity	—	—	●0.05● (IRA 1-Jan-2016)
Total impurities	—	—	●1.0● (IRA 1-Jan-2016)

[a] 1-Hydroxy-3-(2-methoxyphenoxy)propan-2-yl carbamate.
[b] 4-[(2-Methoxyphenoxy)methyl]-1,3-dioxolan-2-one.

SPECIFIC TESTS

- **Loss on Drying** ⟨**731**⟩
  Analysis: Dry at 60° for 2 h.
  Acceptance criteria: NMT 0.5%

ADDITIONAL REQUIREMENTS

- **Packaging and Storage:** Preserve in tight containers. Store at controlled room temperature.

- **USP Reference Standards** ⟨**11**⟩
  USP Guaifenesin RS
  USP Methocarbamol RS