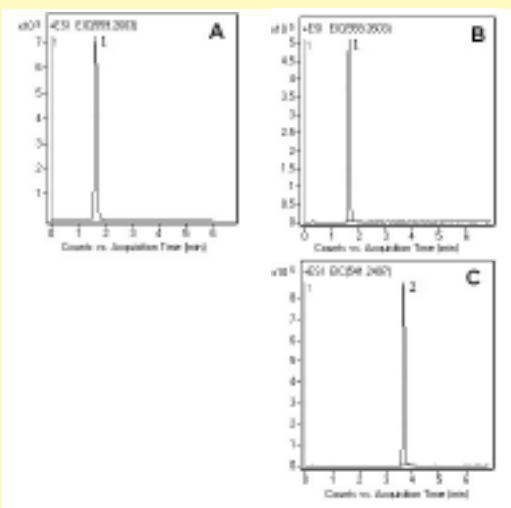
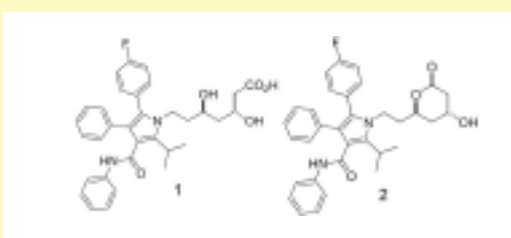


Forced Degradation of Atorvastatin (LC-MS)

Separation of API from its lactone degradation product



Tablet Stock Solution: A 40 mg strength tablet was ground and added to a 100 mL volumetric flask. A 50 mL portion of solvent B was added to the flask. The solution was vortexed 5 min, sonicated 5 min, and diluted to mark with solvent A. It was then filtered through a 0.45 µm nylon membrane (MicroSolv Technology Corp. Eatontown, NJ, USA).

Degraded Tablet Stock Solution: A 40 mg strength tablet was ground and added to a 100 mL volumetric flask. A 50 mL portion of solvent B was added to the flask. It was then vortexed 5 min, sonicated 5 min, and diluted to mark with 3 M HCl. It was then filtered through a 0.45 µm nylon membrane (MicroSolv Technology Corp. Eatontown, NJ, USA).

Method Conditions

Column: Cogent Bidentate C18™, 4µm, 100Å
Catalog No.: 40018-05P-2
Dimensions: 2.1 x 50 mm
Solvents: A: 50% DI water/ 50% methanol/ 10 mM ammonium acetate
 B: 90% acetonitrile/ 10% DI water/ 10 mM ammonium acetate
 Both solutions were vacuum filtered through a 0.45 µm nylon filter (MicroSolv Technology Corp. Eatontown, NJ, USA).

Gradient:

time (min.)	%B
0	30
10	100
12	30

Flow Rate: 0.4 mL/min
Detection: ESI – POS - Agilent 6210 MSD TOF mass spectrometer
Sample: **Figure A:** 10 µL tablet stock diluted with 990 µL 50:50 A:B.
Figures B and C: 10 µL degraded tablet stock diluted with 990 µL 50:50 A:B.
Peaks: 1. Atorvastatin
 2. Atorvastatin lactone

Discussion

Atorvastatin is separated from its main degradation product using a Bidentate C18 column and a simple linear reversed phase gradient. With the use of LC-MS, the identity of the degradant can be confirmed from its m/z value. The degradation is an intramolecular Fischer esterification, which is catalyzed under acidic conditions. Figure A shows the extracted ion chromatogram (EIC) corresponding to atorvastatin for the non-degraded extract. Figures B and C show the EICs of atorvastatin and the lactone degradant respectively for the acid-degraded extract. The atorvastatin lactone peak observed in Figure C was found to be absent in the non-degraded extract. The method shows good retention of both compounds past the void volume (0.4 min) as well as excellent peak symmetry.

For more information visit www.MTC-USA.com

Cat. No.	Description
40018-05P-2	Cogent Bidentate C18™ HPLC Column, 100A, 4µm, 2.1 x 50 mm