



US007202282B2

(12) **United States Patent**
Dennis et al.

(10) **Patent No.:** US 7,202,282 B2
(45) **Date of Patent:** Apr. 10, 2007

(54) **MICROEMULSIONS FOR SELECTIVE MOLECULAR SEPARATION**

4,587,106 A * 5/1986 Bauer et al. 210/643
5,612,300 A * 3/1997 von Blucher et al. 516/58

(75) Inventors: **Donn M. Dennis**, Gainesville, FL (US);
Timothy E. Morey, Gainesville, FL (US);
Richard E. Partch, Hannawa Falls, NY (US);
Dinesh O. Shah, Gainesville, FL (US);
Manoj Varshney, Gainesville, FL (US)

OTHER PUBLICATIONS

Drew Myers, *Surfactant Science and Technology*, second edition (VCH Publishers, NY, NY, copyright 1992) pp. 153-155, 7-1994.*
Leon M. Prince, *Microemulsions Theory and Practice*, Academic Press, Inc, NY, NY (copyright 1977) (01-1979), pp. 68-71.*

(73) Assignee: **University of Florida**, Gainesville, FL (US)

Altria, K.D. "Background Theory and Applications of Microemulsion Electrokinetic Chromatography" *Journal of Chromatography*, 2000, pp. 171-186, vol. 892, month unknown.

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 233 days.

Altria, K.D. "Application of Microemulsion Electrokinetic Chromatography to the Analysis of a Wide Range of Pharmaceuticals and Excipients" *Journal of Chromatography*, 1999, pp. 371-386, vol. 844, month unknown.

(21) Appl. No.: **10/420,608**

Fu, X. et al. "Microemulsion Electrokinetic Chromatographic Separation of Antipyretic Analgesic Ingredients" *Journal of Chromatography*, 1996, pp. 353-356, vol. 735, month unknown.

(22) Filed: **Apr. 22, 2003**

Debusschere, L. et al. "Separation of Cardiac Glycosides by Micellar Electrokinetic Chromatography and Microemulsion Electrokinetic Chromatography" *Journal of Chromatography*, 1997, pp. 227-233, vol. 779, month unknown.

(65) **Prior Publication Data**

US 2004/0011644 A1 Jan. 22, 2004

Related U.S. Application Data

(60) Provisional application No. 60/375,281, filed on Apr. 22, 2002.

Nishi, H. "Pharmaceutical Applications of Micelles in Chromatography and Electrophoresis" *Journal of Chromatography*, 1997, pp. 243-264, vol. 780, month unknown.

Nishi, H. and Terabe, S. "Micellar Electrokinetic Chromatography Perspectives in Drug Analysis" *Journal of Chromatography*, 1996, pp. 3-27, vol. 735, month unknown.

(Continued)

(51) **Int. Cl.**

B01F 3/08 (2006.01)
A01N 43/40 (2006.01)
A61K 31/445 (2006.01)

Primary Examiner—Daniel S. Metzmaier

(74) *Attorney, Agent, or Firm*—Saliwanchik, Lloyd & Saliwanchik

(52) **U.S. Cl.** **516/53**; 210/643; 514/330

(58) **Field of Classification Search** 516/53;
210/643; 514/330

(57) **ABSTRACT**

See application file for complete search history.

The subject invention provides microemulsions having, as one component thereof, electron-deficient aromatic rings, e.g., di(trifluoromethyl) benzene, for efficient separation and/or isolation of target molecules, e.g., bupivacaine.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,337,225 A * 6/1982 Dines 210/638

4 Claims, 2 Drawing Sheets

