

---

# Adsorption of Dimethylanilines on Montmorillonite in High-Pressure Liquid Chromatography

U. Mingelgrin and F. Tsvetkov

Institute of Soils and Water, Agricultural Research Organization The Volcani Center, Bet Dagan 50-250, Israel

**Abstract:** High-pressure liquid chromatography columns were packed with quasi-spherical particles of bentonite (SP-bentonite) which were prepared from a predominantly Na-bentonite powder by spray drying. The strength of adsorption of ring-substituted dimethylanilines on bentonite was directly related to their basicity (pKa). The adsorption of the amino-substituted N, N-dimethylaniline was commonly much weaker than that predicted from its pKa, suggesting that the amino group was the dominant site of interaction between the substituted anilines and the clay.

A better separation between the dimethylaniline isomers was obtained on SP-bentonite than on a neutral silica under the same chromatographic conditions. A selectivity factor of 25 was achieved between the most strongly and the least strongly adsorbed ring substituted isomers (3, 5- and 2,6-dimethylaniline, respectively) on the SP-bentonite. The selectivity factor was 3.4 on the silica. This efficiency of separation demonstrated the potential advantage of the readily available bentonite in high-pressure liquid chromatography. The higher resolution achieved in column runs than in batch experiments may be utilized for the elucidation of mechanisms of interaction of organic molecules at clay surfaces by comparing the interaction of a number of closely related adsorbates.

**Key Words:** Adsorption • Bentonite • Dimethylaniline • Liquid chromatography • Silica

*Clays and Clay Minerals*; August 1985 v. 33; no. 4; p. 285-294; DOI: [10.1346/CCMN.1985.0330403](https://doi.org/10.1346/CCMN.1985.0330403)

© 1985, The Clay Minerals Society

Clay Minerals Society ([www.clays.org](http://www.clays.org))

---