

**SILICA GEL THIN-LAYER CHROMATOGRAPHIC
SEPARATION OF CETYLPYRIDINIUM CHLORIDE
(CPC) FROM POLYOXYETHYLENE (20) SORBITAN
MONOLAURATE (TWEEN-20)**

A. Mohammad^{*} and *S. A. Bhawani*

Analytical Research Laboratory, Department of Applied Chemistry, Faculty
of Engineering and Technology, Aligarh Muslim University, Aligarh-202002, India

SUMMARY

Thin-layer chromatography of eleven cationic and non-ionic surfactants has been performed on silica gel layers with tetrahydrofuran (THF)-containing aqueous mobile phases. The mobile phase tetrahydrofuran–water 6:4 was identified as best for mutual separation of cetylpyridinium chloride (CPC) and polyoxyethylene (20) sorbitan monolaurate (Tween-20). The effect of the nature of the adsorbent (silica gel, alumina, or kieselguhr) on the mobility of the surfactants was examined and the comparative efficiency of each adsorbent was evaluated. The effect of metal cations as foreign substances on the mutual separation of CPC and Tween-20 was also examined. Limits of detection were determined for CPC and Tween-20 and semi quantitative determination of CPC was also attempted.

INTRODUCTION

Surfactants, which are amphipathic compounds, have many applications, for example in the chemical, pharmaceutical, and food industries, and in hospitals, homes, and other environments, for cleaning, emulsification, solubilization, and moisturization [1]. Surfactant mixtures are used in a variety of industrial processes, for example in synthetic detergents, in drug design, in waste-water purification, and in oil production [2–4]. Cationic and non-ionic surfactants are known to affect biological and chemical processes. For example, cationic surfactants, including quaternary ammonium compounds, have antimicrobial activity [1,5] and are known to disrupt cell membranes [6], interrupt protein function [7], release intracellular K⁺ and other constituents [8,9], and induce cell autolysis [10,11]. Non-ionic surfactants promote penetration of hydrocortisone through skin [12], enhance