Ellipsometric Studies of Phospholipid Multilayers. Temperature Dependent Transitions and Forces between Bilayers of 14:0/14:0 Phosphatidyl Serine

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We studied the preparation of regular multilayers of 14:0/14:0 on chromium slides with the following results.

1) Any number of layers of 14:0/14:0 PS can be transferred onto solid chromium surfaces under conditions of pH = 6, surface pressure 40 dynes, Ca^{2+} concentration: 5 µmol. These layers have a refractive index 1,457 ± 0.009 and a thickness of 29,2 ± 0,6 Å per monolayer (mean ± SD).
2) The temperature dependent transitions of these layers as a function of pH are perfectly in agreement with the values found in the literature measured on vesicles by differential scanning calorimetry.
3) Changes in temperature dependent transitions as a function of pH and NaCl concentration can not be adequately described by the Gouy Chapman theory for the ionic double layer.
4) Determination of temperature dependent transition in random smears and stacked layers of 14:0/14:0 PS gave identical results.
5) Swelling (changes in thickness and refractive index) as a function of pH in 0.15 M NaCl is explained by a simple osmotic model.