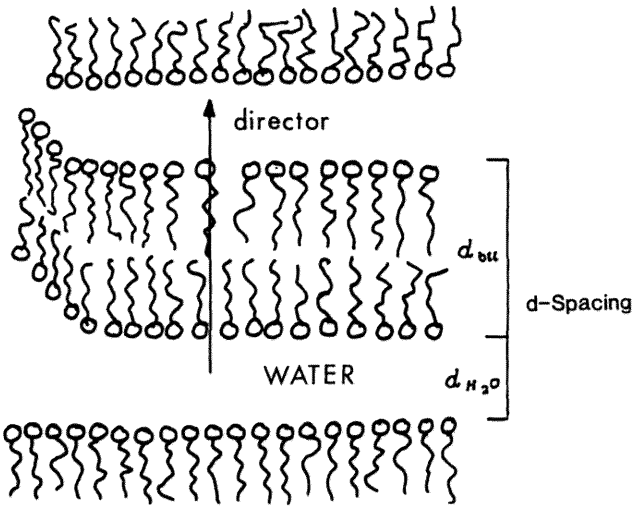

Figure 4.1 The arrangement of surfactant molecules in the lamellar liquid crystal phase.

not suffer from some of the inherent instabilities encountered in vesicles.

The choice of enhancing agent systems is based upon those commonly used and studied; namely, oleyl alcohol, propylene glycol, and dodecyl (rhexahydro-2*H*-azepin-2-dione laurocapram; Azone), which has been regarded as having some potentially novel features (4). The behavior of oleyl alcohol and laurocapram, both singly and in combination with propylene glycol, has been investigated when incorporated in the lamellar phase of *n*-dodecylpentaoxyethylene glycol ether ($C_{12}EO_5$).

To study this type of system, techniques sensitive to the dimensions of the associated structures and the time scales of the system's dynamics are required. The most powerful techniques available for such studies of anisotropic phases are those of small-angle x-ray diffraction and nuclear magnetic resonance (NMR). Therefore, a brief background and description of these methods will be given as an aid to understanding the presented data.

II. EXPERIMENTAL BACKGROUND

A. Nuclear Magnetic Resonance

Nuclear magnetic resonance (NMR) is arguably the most powerful method for investigating the dynamics and structure of associated