other transitions including relaxational ones, or even deformation and fracture at stress. Being very tempting this hypothesis needs, certainly, more theoretical considerations and precise experimental studies.

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THE STRUCTURE OF POLYACRYLATE--SURFACTANT COMPLEXES

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The structure of complexes between a cross-linked polyacrylic acid (cl-PANa) and a cationic surfactant such as cetyltrimethyl-ammonium bromide (CTAB) has been studied by SANS and SAXS. The neutron scattering curves for the samples were fitted using Ornstein-Zernike correlation function $I(Q) \sim 1/(1 + Q^2\xi^2)$ (where $I(Q)$ is the intensity of scattering and ξ is the correlation length. It was found that ξ=500 Å for the sample of cl-PANa in D_2O and ξ=560 Å for cl-PANa-CTAB in 2.5% D_2O (2.5% D_2O is the matching point for CTAB). We conclude that the dimension of large-scale density fluctuations of a pure gel is approximately that of a polycomplex.

X-ray studies of the polycomplexes suggest the existence of a certain periodicity. The X-ray scattering curves of dry and swollen samples have two well-pronounced diffraction maxima associated with interplanar spacings d_1 and d_2 ($d = 2\pi/Q$, where Q is scattering vector for a maximum). The ratio of d_1/d_2 is equal to two. This suggests a lamellar structure with a period of 33 Å and 42 Å for dry and swollen samples, respectively.

Thus, X-ray and neutron data allow the polycomplexes structure to be represented as a system of charged surfactant lamellae embedded in an oppositely charged network as is shown in Fig.

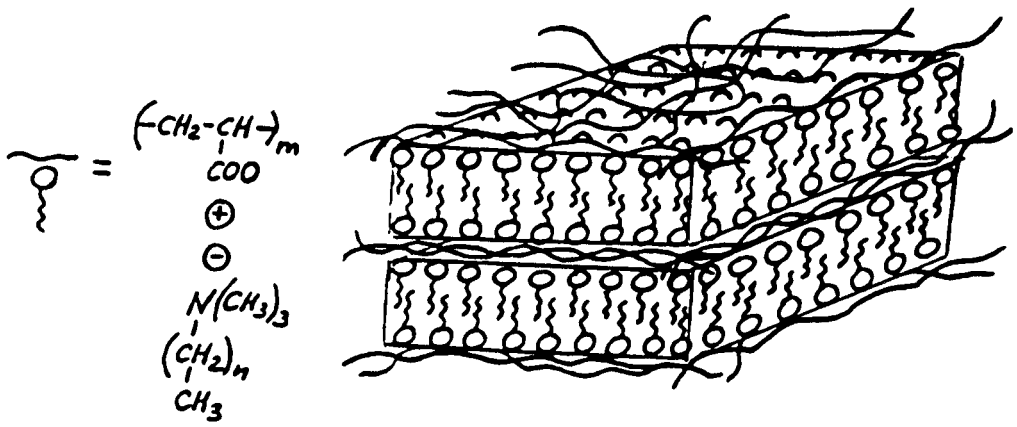

Fig. The structure of PSC

SPECTROMETER FOR STUDYING BROAD MAGNETIC DIPOLE TRANSITIONS IN MAGNETS AND THE HALL CONDUCTIVITY AT MICROWAVE FREQUENCY IN CONDUCTING MATERIALS

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It frequently happens in studying of magnets that an ESR signal is unobservable by traditional ESR spectrometer that used a static field modulation when a resonant transition is broad. Recently this problem has taken on particular interest in connection with the inability to obseve the ESR signal from Cu^{2+} (spin $S = 1/2, 3d^9$ electron configuration) in cuprates – high temperature superconductors and related compounds up to the far paramagnetic range of temperatures of the order of the exchange integral J in the CuO_2-plane [1]. Here we describe the X-band ESR spectometer ($f = 8.54$ GHz) that makes it possible to study broad ESR tpansitions. It has the following main features [2]:

1) A cylindrical two-mode balanced cavity with TE_{111} type of oscillation [3] is used in spectrometer. The static magnetic field H is along the cylinder axis (z-axis). The deep frequency-independent balance between excitation (x-axis) and receiver (y-axis) modes allows one to use in the spectrometer a high power microwave source without its frequency or amplityde noise appearence at the input of the detector. It allows to improve the spectrometer sensitivity ($\chi_{mon} \sim P^{-1/2}$). The detected signal is proportional to x_{yx} – the off-diagonal