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RAMAN SPECTRA IN FLOWING LIQUIDS

Dear Miss Wakeling,

It is well known [1,2] that during the flow of a liquid crystal through a tube there is a change in the value of many physical parameters as the retractive index or dielectric constant. These changes are related to the anisotropy at the fluid caused by the orientation of molecules during the flow.[1,2,6] Similar changes also caused by an external magnetic or electric field applied on the system.[1,3,4]

A result of orientation of the molecules during the flow is the change in the shape of the Rayleigh scattering.[5] In our experiments we have evidence that such changes also occur in shape of the Raman bands in some liquid crystals as p-methoxybenzylidene-p-n-butylaniline at 25°C and p-azoxyanisole at 120°C. We noticed strong changes in the relative intensity of the Raman bands and in their width which depend on the flow velosity. The shape of the Raman bands is also effected by the application of an external magnetic field of 2800 Gauss.

In similar experiments with liquids $(C_6H_5)_2O$, $(C_6H_5)_2C = CH_2$, $C_6H_5NO_2$, $CHCl_3$ and with aqueous solutions of electrolytes there are only small changes in the Raman spectrum.

For the above experiments we used He-Ne 70mW - Laser (Spectra physics Model 125), double monochromator (Jarrell-Ash 25-103), photomultiplier S-20 (I.T.T. - F.W.130), photon-counting and a special furnace to thermostate the p-azoxyanisole at (120±2)° C.

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We feel that using a more elaborated system and specifically a more powerfull Laser, we can obtain, under the above experimental conditions, Raman spectra which will furnish more information about the structure and the behavior or the liquid crystals, liquids and solutions.

For the evaluation of the above experimental data it is necessary to apply to them a theoretical treatment.

Sincerely yours,

G Papavassiliou

G.C.Papavassiliou

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