

High frequency mode in a new antiferroelectric mixture

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Dielectric spectroscopy measurements is a very important and useful experimental technique for characterisation of liquid crystal phases. In liquid crystals phases many dielectric modes are detected (Soft, Goldstone, P_H , P_L modes). The most important are relations between dielectric permittivities (ϵ' , ϵ'') and frequency f of measuring AC-field.

The subject of investigation was the antiferroelectric mixture W-1000 which was synthesized in Military University of Technology.

Relaxation frequency f_R , static electric permittivity ϵ_s , high frequency electric permittivity limit ϵ_∞ were calculated from Cole-Cole diagrams, using special software COLE-COLE.VEE prepared in our laboratory (it finds all parameters of Cole-Cole plots by finding semicircle, which best suits to experimental points). Relaxation frequencies of detected modes versus temperature are presented in the figure.

We found the high frequency relaxation, what was firstly announced in pure fluorinated antiferroelectric compound [1]. We calculated energy of activation all detected modes and discussed the possible sources of high frequency mode.

References:

[1] P. Perkowski, W. Piecek, Z. Raszewski, K. Ogrodnik, J. Rutkowska, M. Żurowska, R. Dąbrowski, J. Kędzierski, X. Sun, *Ferroelectrics*, 2008, Volume 365, Page 88

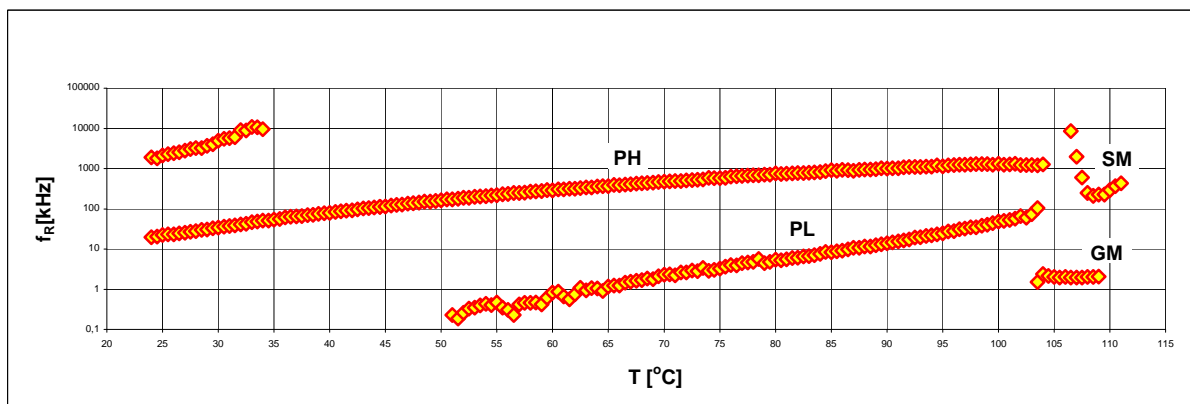


Figure. Relaxation frequency f_R all detected modes as a function of temperature T .